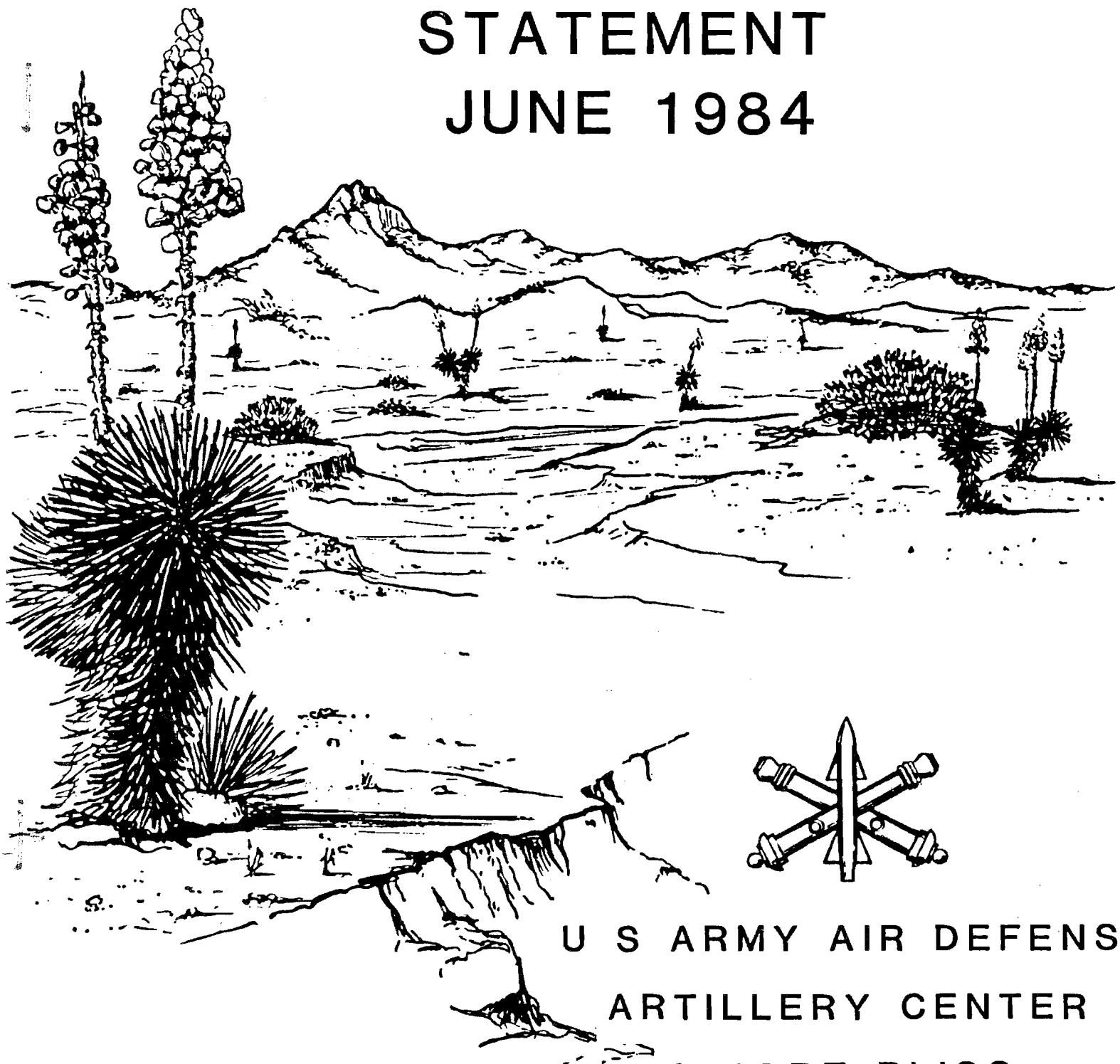
FORT BLISS ONGOING MISSION ENVIRONMENTAL IMPACT STATEMENT JUNE 1984



U S ARMY AIR DEFENSE
ARTILLERY CENTER
& FORT BLISS

Fort Bliss, Texas

LEAD AGENCY: DEPARTMENT OF THE ARMY
TRAINING AND DOCTRINE COMMAND

COOPERATING AGENCY(IES): NONE

TITLE OF PROPOSED ACTION: FINAL ENVIRONMENTAL IMPACT STATEMENT OF ONGOING MISSION, FORT BLISS, TEXAS

AFFECTED JURISDICTION: A. State of Texas
El Paso County

B. State of New Mexico
Otero and Dona Ana Counties

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DOCUMENTATION DESIGNATION: Final Environmental Impact Statement

ABSTRACT: This Final EIS updates a Draft EIS of the same title published in March 1979. The EIS evaluates the environmental effects of firing of air defense missiles, tactical maneuvers conducted with tanks and other heavy vehicles, and live fire conducted with artillery, tank cannon, and assorted small arms. The military mission of Fort Bliss is needed as part of the national defense effort. Alternatives considered include the consequences of moving the military mission to some other location in general and to White Sands Missile Range in particular. The principal environmental impacts discussed in the EIS include effects to vegetation and soils, to historic properties, to the finite water supply of the El Paso area, to the economy of El Paso, and to future access to and uses of areas currently used as live-fire impact areas. The principal known consequence of the action, that is not already the subject of a specific, remedial management program, is the creation of areas contaminated with dud ordnance.

REVIEW COMMENT DEADLINE: NONE

SUMMARY

ONGOING MISSION, FORT BLISS, TEXAS

( ) Draft (X) Final

Responsible Office: Commander
U.S. Army Air Defense Artillery Center and Fort Bliss
Fort Bliss, Texas

1. Name of Action: (X) Administrative ( ) Legislative

2. Description of Action:

The action being evaluated is the ongoing military training conducted at the U.S. Army Air Defense Artillery Center and Fort Bliss, hereafter referred to as Fort Bliss. The field training includes firing of air defense missiles, tactical ground maneuvers conducted with tanks and other armoured vehicles, live fire of artillery, tank cannon and assorted small arms, training of transportation, fuel, communication and similar support units, training of Special Forces and Ranger units, occasional combined arms exercises involving major military field training. Activities not conducted in the field include classroom training and the various support functions of the cantonment area.

3. Summary of Impacts.

a. Environmental Impacts: The assessment process has identified the following four principal areas of potential environmental impact.

(1) Ecology

(2) Archaeology

(3) Air Quality

(4) Water Supply

Accordingly, these subjects are examined in the study. Socio-economic impacts also were examined because Fort Bliss is the single largest employer in the El Paso area and its impact to the social and economic fabric of the local community is of major consequence.

b. Adverse Environmental Effects: Adverse environmental effects of Fort Bliss ongoing mission include soil erosion, destruction of vegetation and wildlife habitat, and damage to archaeological resources located on Fort Bliss. Dust introduced into the atmosphere as a result of maneuvering vehicles also contributes to the air pollution problem of the El Paso Area. The operation of Fort Bliss increases the rate of depletion of the ground water resources of the area, and creates areas contaminated with dud ordnance.

4. Alternatives.

a. Locating a range for missile firing and surface maneuvers elsewhere.

b. Using White Sands Missile Range for the activities on Fort Bliss.

c. Status quo.

5. Federal, State, local agencies, and individual comments received:

Texas Archaeological Society, Dallas, Texas
West Texas Council of Governments, El Paso, Texas
New Mexico State Planning Division, Santa Fe, New Mexico
Texas Office of the Governor, Austin, Texas
Texas Department of Water Resources, Austin, Texas
U.S. Department of Labor, Washington, D.C.
U.S. Soil Conservation Service, Tempe, Texas
U.S. Department of Housing and Urban Development, Dallas, Texas
U.S. Department of Health, Education, and Welfare, Atlanta, Georgia
U.S. Environmental Protection Agency, Dallas, Texas
U.S. Department of the Interior, Albuquerque, New Mexico
U.S. Advisory Council on Historic Preservation, Washington, D.C.

6. Fort Bliss is in compliance with the following federal laws and requirements:

a. Clean Air Act of 1977, as amended, (Public Law 95-95).

b. National Historic Preservation Act, as amended, (Public Laws 89-665, 91-243, 93-243, and 96-515).

c. Clean Water Act of 1976, as amended, (Public Law 95-217).

d. Safe Drinking Water of 1974, as amended, (Public Law 94-469).

e. Resources Conservation and Recovery Act of 1976, as amended, (Public Law 94-580).

f. Toxic Substances Control Act of 1976, as amended, (Public Law 94-469).

g. Noise Control Act of 1972, as amended, (Public Law 92-574).

7. List of Preparers:

a. Mr. Fazlur Rab, Chief, Environmental Protection Office (EPO), Directorate of Engineering and Housing (DEH), Fort Bliss, Texas.

b. Dr. Glen D. DeGarmo, Archaeologist, EPO, DEH, Fort Bliss, Texas.

c. Mr. Rafael Nickolas, Jr., Environmental Engineer, EPO, DEH, Fort Bliss, Texas.

d. Mr. Kevin von Finger, Ecologist, EPO, DEH, Fort Bliss, Texas.

8. The final environmental impact statement (EIS) does not conform to the CEQ recommended format (CEQ Regulations 1502.10), the EIS was issued in draft form prior to CEQ distribution of a recommended format. The format originally used in the draft has been retained to permit easy comparison of the draft and final documents.

9. Draft Statement to USEPA: Notice published in the *Federal Register*, 20 July 1979.

10. Final Statement to USEPA:

FINAL
ENVIRONMENTAL IMPACT STATEMENT
ONGOING MISSION,
UNITED STATES ARMY AIR DEFENSE ARTILLERY CENTER
AND FORT BLISS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLES

FIGURES

TABLE OF CONTENTS

FINAL

ENVIRONMENTAL IMPACT STATEMENT

ONGOING MISSION,

U.S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS

I. PROJECT DESCRIPTION.

A. Purpose of Action. The purpose of this action is to evaluate the environmental impact resulting from ongoing military activities conducted at the U.S. Army Air Defense Artillery Center and Fort Bliss, located near El Paso, Texas. (see Figures 1, 2, and 3).

B. Description of Action.

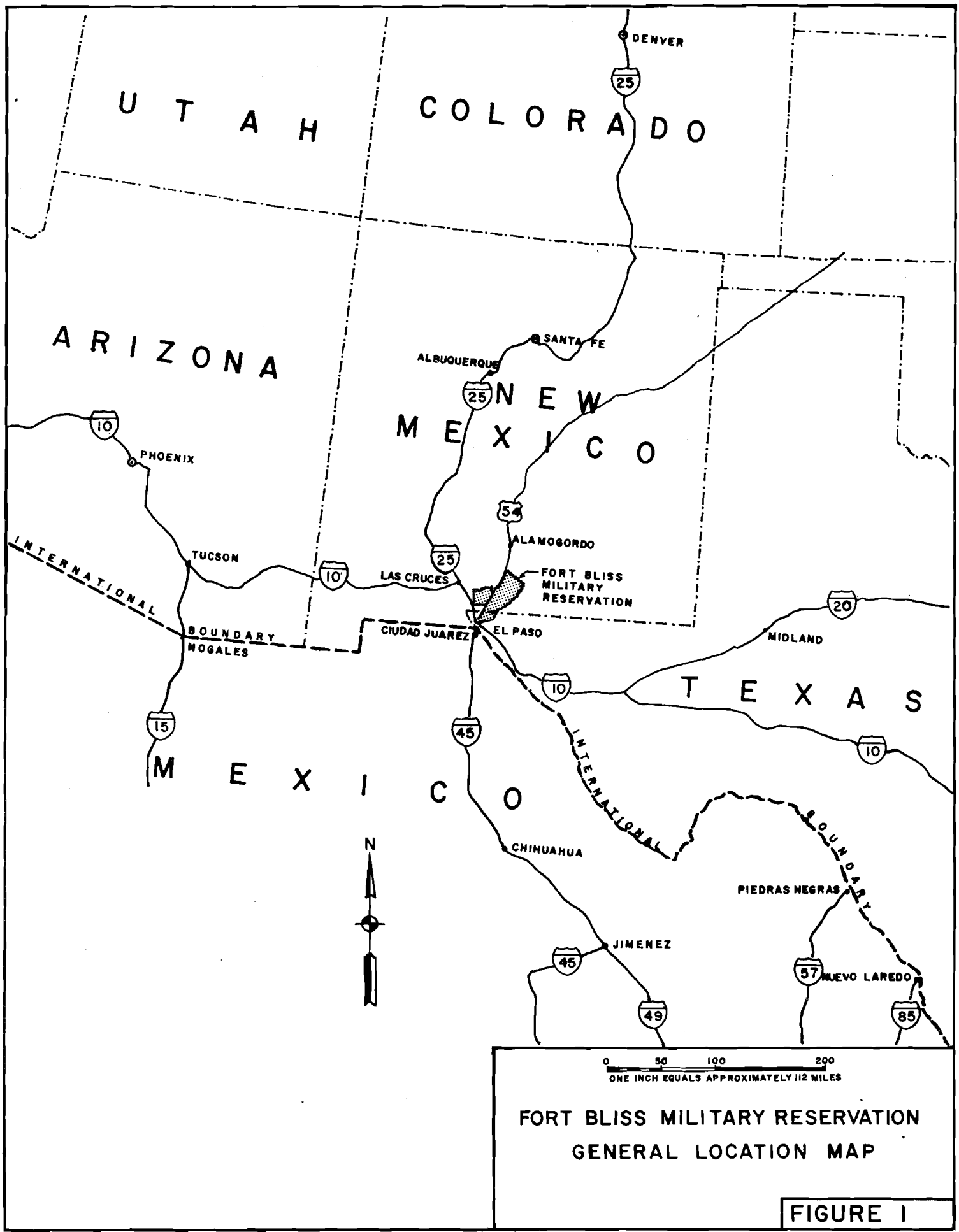
1. Name of Action. Ongoing mission of the United States Army Air Defense Artillery Center and Fort Bliss.

2. Summary of Activities. The action described herein involves all ongoing missions and activities conducted by the United States Army Air Defense Artillery Center and Fort Bliss (USAADACENFB), including all supporting activities and operations. Training activities include field training exercises employing troops, equipment, and vehicles in tactical situations, missile and artillery firings, aerial gunnery training, air support operations and other activities related thereto. In addition to training activities, this action involves the testing of military ordnance and weapons systems. Also involved in this action are the day-to-day activities associated with the support of training and the operation of the installation. Support and operation activities include such things as family housing and troop billeting, maintenance and repair of facilities, provision and operation of utility systems, transportation, food services, recreational services, medical services, supply operations, police protection, fire protection, and similar activities associated with the operation of a major military installation. Summary of ongoing missions, by function, is as follows:

a. Current Mission: The mission of the U.S. Army Air Defense Artillery Center and Fort Bliss, Fort Bliss, Texas, is to maintain assigned Strategic Army Forces units at a readiness condition (REDCON) equal to or higher than their assigned authorized levels of organization, within available resources, and to:

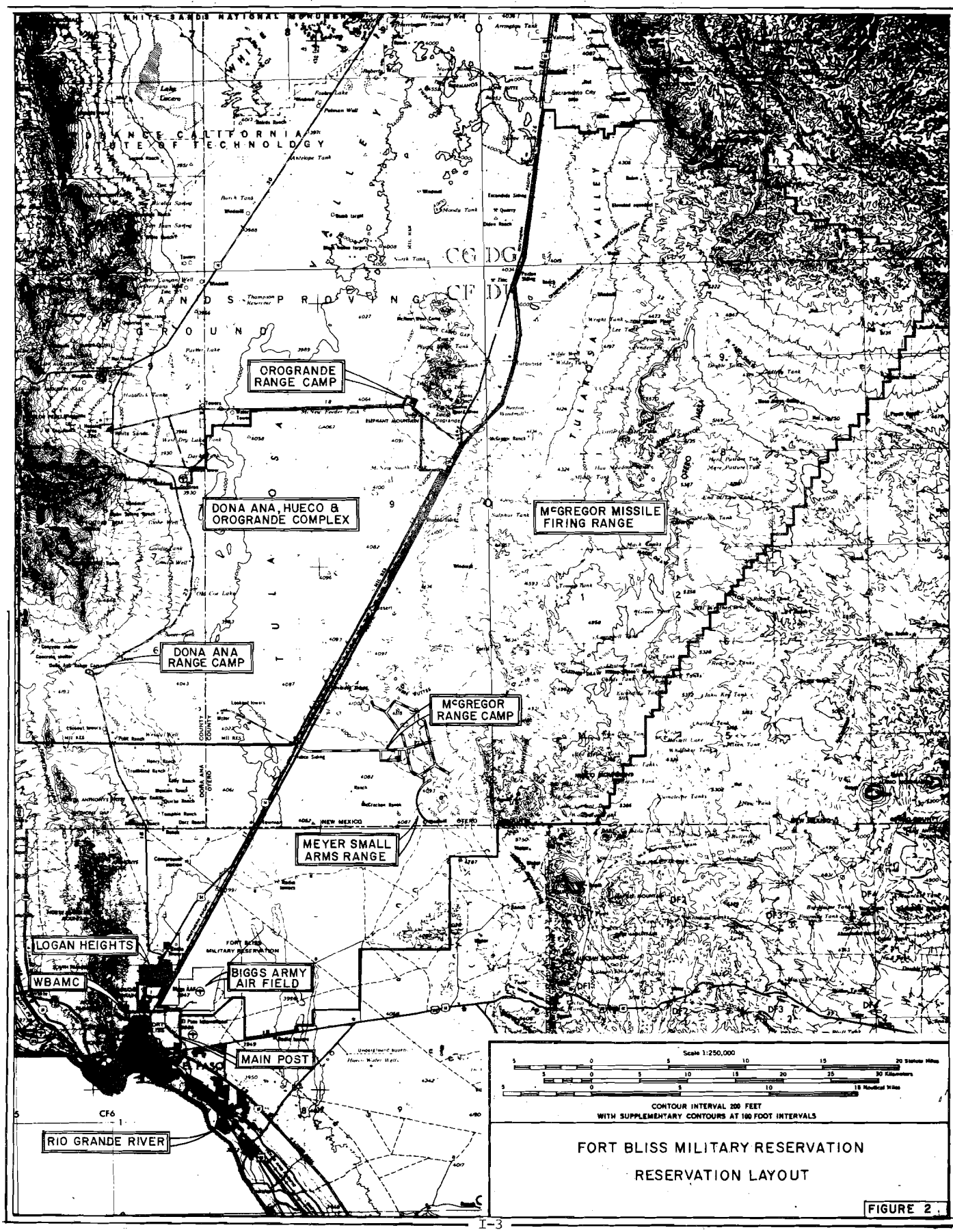
(1) Command all activities and units assigned or attached to the U.S. Army Air Defense Artillery Center and Fort Bliss.

(2) Provide administrative and logistics service to the U.S. Army Air Defense Artillery School.



FORT BLISS MILITARY RESERVATION
GENERAL LOCATION MAP

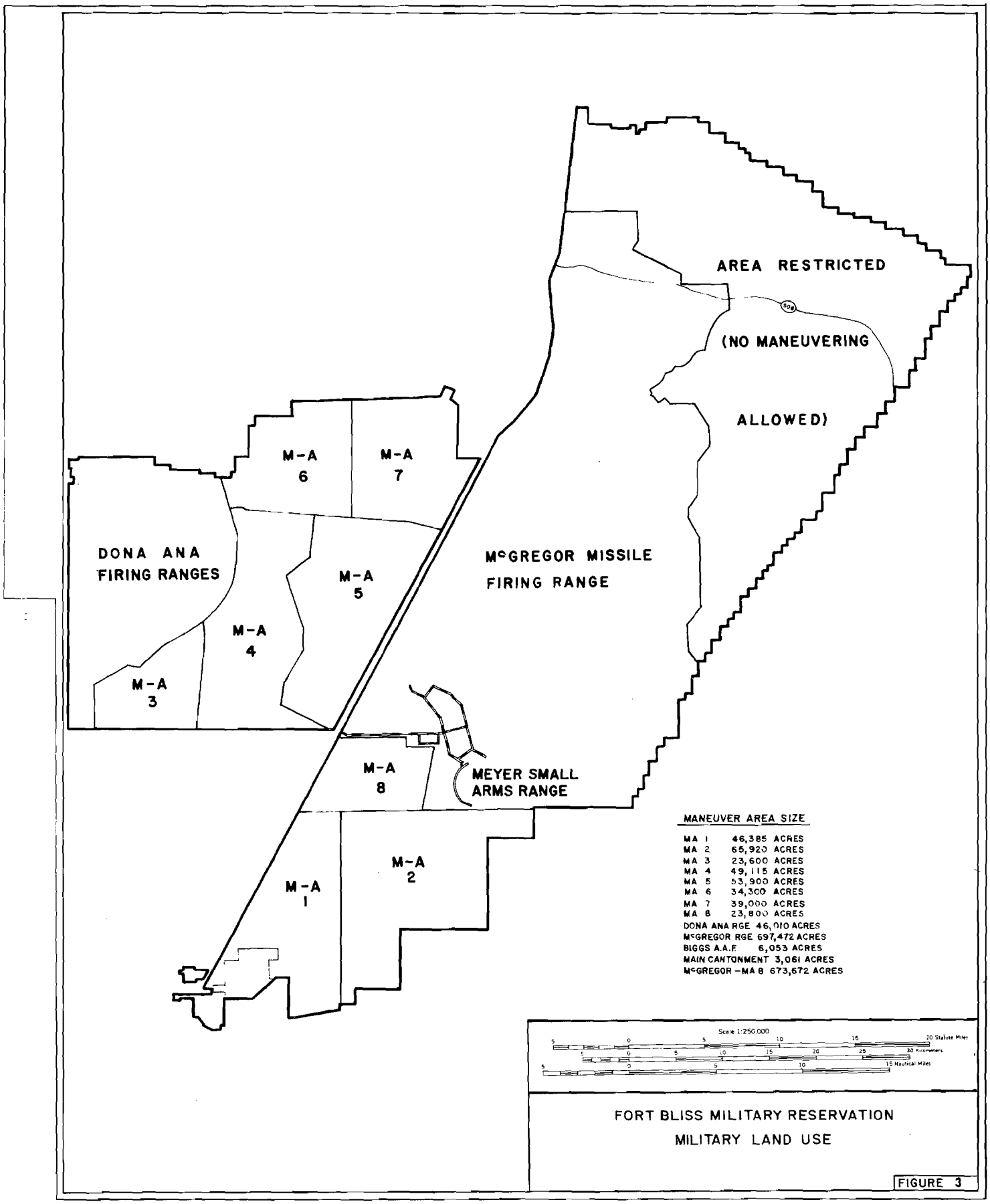
FIGURE 1



FORT BLISS MILITARY RESERVATION

RESERVATION LAYOUT

FIGURE 2



FORT BLISS MILITARY RESERVATION
MILITARY LAND USE

FIGURE 3

(3) Receive, administer, train, and deploy Army National Guard, Army Reserve, and Reserve Forces Act personnel and personnel of other services and countries in accordance with current directives.

(4) Furnish administrative, logistical (medical supply, medical maintenance, and hospital facilities excepted) and environmental support of all units and activities of the Active Army, National Guard, Army Reserve, and Reserve Officer's Training Corps (ROTC) stationed, satellited, or assigned to the Fort Bliss McGregor Range and Dona Ana—Hueco—Orogrande Range Complex (DAHORC) for training, summer encampments, and annual service practices; and provide technical instruction teams for Active Army and Reserve Forces units as directed. To provide support to satellited activities, units, and other Department of Defense Activities or other governmental agencies as directed or established in written agreement.

(5) Coordinate and support the execution of annual service practice for air defense units and, when required, surface-to-surface units as directed by the United States Army Training and Doctrine Command (TRADOC) and the United States Forces Command (FORSCOM).

(6) Organize, train, and equip, when necessary, units for continental United States and overseas deployment.

(7) Activate and train air defense units for North Atlantic Treaty Organization nations and other Allied nations.

(8) Accomplish the planning and preparation tasks assigned by Headquarters, TRADOC Basic Plan and FORSCOM General War Plan (GWP), and execute portions of those plans as directed.

(9) Support the activities of tenant or satellited activities/installations assigned to Fort Bliss, to include the Defense Subsystem Office, El Paso Autovon; the Defense Investigation Service, El Paso Field Office; the Fort Bliss District Sixth Region - U.S. Army Investigation Command; the U.S. Army Intelligence and Security Command, 902nd Military Intelligence Group; the Corps of Engineers, Fort Worth Resident Office; the Army Research Institute; the Headquarters, 5th Battalion, 200th Air Defense Artillery ROLAND; the U.S. Army Material Development and Readiness Command, Assistance Office; the Tactical Air Control Systems/Tactical Air Directions Management Section; the Project Manager, SGT YORK Gun System; the PATRIOT Deployment Support Office; the El Paso U.S. Army Reserve Center; the Defense Property Disposal Office—Defense Logistic Agency; the U.S. Army Commissary-Fort Bliss; the U.S. Operational Testing Evaluation Agency, Field Office; the PATRIOT Test Directorate; the Nuclear Weapons Support Detachment; the 101st Air Base Defense Squadron; and the U.S. Army Sergeants Major Academy.

(10) Operate the First Air Defense Artillery (ADA) and School Brigade, to include:

(a) Training for air defense weapon gunners and controllers for both existing and new weapons systems.

(b) One Station Unit Training for Military Occupational Specialties (MOS) related to air defense weapons systems.

(c) Transitional training for noncommissioned officers for assignment to ADA units.

(d) A Leadership Preparation Course for training Active Army students in leadership and military skills.

(e) Training, equipment, and administration for United States and foreign national surface-to-air missile units, packages, and warhead

detachments, except direct or general support units. Administrative support associated with units or packages.

(f) Maintaining and supporting I-HAWK, NIKE HERCULES, Air Defense Artillery automatic weapons (M12, M55), REDEYE, and CHAPARRAL/VULCAN, Forward Area Alerting Radar and Defense Acquisition Radar equipment.

(11) Protect the rights of Army personnel who may be subject to the exercise of criminal jurisdiction by Mexican tribunals or who may be confined in Mexican penal institutions in towns adjacent to the border.

(12) Command, train, and provide administrative and logistical support for all FORSCOM units stationed at Fort Bliss, currently including the 3rd Armored Cavalry Regiment and the 11th Air Defense Artillery Brigade.

(13) Operate Biggs Army Airfield.

(14) Provide services and facilities to the German Air Force Defense School in accordance with current agreement.

(15) Provide services and facilities to elements of the U.S. Army Missile Readiness Command (MIRCOM), and to the U.S. Army Materiel Development and Readiness Command (DARCOM) located on Fort Bliss.

(16) Accomplish other missions as assigned by higher headquarters.

b. Tenant Missions:

(1) In addition to missions outlined in subparagraph (9), this action covers other tenant activities, such as ground-to-ground missile firings, desert training by armor units, and armored weapons testing, and multiservice, combined arms joint exercises that are periodically conducted at this installation by Department of Defense units stationed elsewhere.

(2) Additional missions added since the draft statement was published include desert training by Army Ranger and Special Forces units with permanent cadre stationed at Fort Bliss.

C. Environmental Setting.

1. Environment Prior to Proposed Action.

a. Location: Geographically, Fort Bliss is located in the far west corner of the State of Texas and the south-central part of New Mexico. The Fort Bliss Military Reservation is an elongated area encompassing slightly more than one million acres of land. Width varies from 30 to 50 miles; length is approximately 70 miles. Approximately 200,000 acres of the total is owned in fee simple by the Army. Public domain land comprises approximately 800,000 acres. Of the total acreage, 40,000 is leased land. The majority, 994,477 acres is in New Mexico; the remainder, about 120,000 acres, is in Texas. Lands reported as public domain land contain 18,000 acres of National Forest land under the jurisdiction of the Department of Agriculture, used by the Army under a Memorandum of Understanding (MOU).

b. History: The history and culture of the El Paso/Fort Bliss area are unique; inhabitants of the region have descended from American-Indian, Spanish, and Anglo stock, and an intermingling of the three cultures is readily apparent. Historical records of El Paso del Note (The Pass of the North) date back to about 1536 when the Spanish explorer, Cabeza de Vaca, passed through the strategic mountain pass just west of the present location of Fort Bliss. This pass became a gateway for the Spanish Conquistadores

and Catholic priests traveling between Mexico and the Rio Grande Valley settlements in New Mexico. In 1598, Don Juan de Oñate proclaimed the country the property of King Phillip II of Spain and named the town (now Ciudad Juarez, Mexico) El Paso del Norte. In 1668, a permanent church was completed and dedicated "Nuestra Señora de Guadalupe del Paso." Around the church, a settlement grew. The treaty of Guadalupe Hidalgo (1848) split the town in half and made the Rio Grande the boundary between El Paso, Texas, and Juarez, Mexico. Establishment of Fort Bliss was made to protect trade routes and early settlers against Indians and bandits. The first American military use of the area that was to become Fort Bliss was in 1846 when Colonel Alexander Doniphan led a group of Missouri volunteers through El Paso del Note en route to military successes at Chihuahua and the Sacramento Pass during the Mexican War. Two years after Colonel Doniphan's campaign, the War Department ordered the establishment of a post at El Paso.

The establishment of Fort Bliss is based on General Order Number 58, dated November 7, 1848, published by the Adjutant General's Office, Washington, D.C., stating that: "Six companies of the Regiment now in Texas, will, as soon as the necessary reconnaissance can be made in the direction of El Paso, be put en route for that post." The fort was established at the site of Smith's Ranch, which is now downtown El Paso, and which was formerly owned by Juan Maria Ponce de Leon.

The initial mission of Fort Bliss was to protect trailways and settlers from hostile forces during our country's westward expansion. During the 1849 gold rush to California, the post played an important role in the protection of the southern route through this area. In 1854, the post was officially named Fort Bliss in honor of Brevet Lieutenant Colonel William Smith Bliss, General Zachary Taylor's adjutant general during the war with Mexico and later his secretary when Taylor became President.

In that same year, the original site at Smith's Ranch was abandoned, and a new post established at Magoffinville, where it remained for 14 years. Early in 1868, floodwaters from the Rio Grande seriously damaged the post, and in March 1868, Fort Bliss was moved to higher ground and was rebuilt on a site called Concordia.

In 1879, Fort Bliss was established as a permanent Army post, and the Government purchased a tract of about 135 acres at Hart's Mill on the Rio Grande river's edge. In 1890, Congress appropriated $1,500,000 for the construction of a military installation on La Noria Mesa, the present site of Fort Bliss. Most of the brick structures built during that time are still in use. The post was built on land which was donated by the citizens of El Paso.

The garrison at Fort Bliss remained small until 1914 when Fort Bliss expanded to over 60,000 troops as a result of the accelerated activities of General Francisco Villa of Mexico and of the Mexican Revolution.

Fort Bliss became a cavalry post in the early 1900s and remained so until 1942 when it became a center for anti-aircraft artillery training. The current mission, established on July 1, 1957, is that of the U.S. Army Air Defense Artillery Center where U.S. and Allied personnel are trained in the use of all types of air defense weapons, including missiles and other anti-aircraft weapons.

c. Climate: Fort Bliss lies in the northern Chihuahuan Desert, climatologically semi-arid. Typical of semi-arid continental regions, it is characterized by low relative humidity, hot summers, moderate winters and temperatures of wide variance. A dry season prevails rrom winter to early summer. Spring months are characterized by high winds and blowing dust. During the mid-summer rainy season, thunderstorm activity is frequently intense.

The frost-free season averages 235 days. November 15th is the average date of the first killing frost and March 20th is the average date of the last. On the average, temperatures drop below freezing 34 days a year, usually followed by daily thaw. Daily temperatures of 90 degrees or more occur on the average of 87 days a year. The average annual temperature at Fort Bliss is 63.3° and the recorded extremes are 112° and -6 °F.

Precipitation during the summer months is usually in the form of thundershowers of short duration, resulting from convection or orographic lifting or a combination of both. The more intense of these storms follow a period of the inflow of warm, moist air from the Gulf of Mexico. Occasionally, precipitation follows an invasion of moist Pacific air. Frontal activity is prevalent during the cooler months, usually in the absence of moist air. A 61-year average annual precipitation amounts to 7.89 inches, with a minimum of 2.22 inches and a maximum of 18.29 inches. Light snow falls nearly every winter with an average of 4.6 inches. The maximum snowfall during a 24-hour period was 8.8 inches, and it occurred in April 1983.

d. General Socioeconomic Conditions: The main post area of Fort Bliss is bounded on the south and west by the City of El Paso, Texas. The January 1980 population census for the City of El Paso was 419,700. Estimated population for 1990 is between 496,000 and 545,000 (Valdez, 1980). The economy of El Paso is based on federal activities, distribution, various manufacturing activities (with apparel predominating), mineral and petroleum processing, tourist trade, and agriculture. Trade from Mexico, primarily from Ciudad Juarez accounts for approximately 30 percent of the retail trade in the downtown area. However, the spendable income from Ciudad Juarez has been sharply reduced due to the devaluation of the peso. The fertile Rio Grande Valley, in El Paso County, produces over $24.5 millions of farm income from varied crops, livestock, cattle and egg production. Cotton is the leading crop, while truck crops are growing in importance. Land values in El Paso are increasing at a rate of about eight percent per year.

SELECTED ECONOMIC IMPACT DATA FOR FISCAL YEAR 1983.

a. Military and civilians assigned to Fort Bliss
(12 month average, Oct 82 through Sep 83)

(1) Military: 19,829
(2) Civilian: 7,790

b. Percentage of military living off-post: 32% (6,275)

c. Number of dependents in school:

(1) Military dependents: 7,596
(2) Civilian personnel dependents: 4,187

d. Number of retirees living in area (100-mile radius): 14,195

(Broken down as 10,467 Army, 3,728 other services).

e.	Total amount of salaries (Oct 82 through Sep 83)	
	(1) Military:	$ 275.6 million
	(2) Civilian:	111.5 million
	(Includes: NAF $4.0 million PX and Consession $7.6 million Miscellaneous $15.5 million)	
f.	Annual local purchase and contracts (Oct 82 through Sep 83):	73.7 million
g.	Annual expenditures by German Air Force Training Command (Oct 82 through Sep 83):	22.8 million
h.	Annual retiree pensions (Oct 82 through Sep 83):	114.8 million
i.	Impact aid for federally connected school children (Oct 82 through Sep 83):	2.4 million
	TOTAL	$600.8 million

Education and Income: The 1970 median education for El Paso County residents was 12.0 years, slightly higher than the median education level for the State of Texas (11.6 years). However, the El Paso County median family income of $7,790 ($2,341 per capita) was lower than the state median family income level of $8,486 ($2,792 per capita). Similarly, a greater proportion of the El Paso County population, 17.4 percent, exists below the poverty level. The 1970 proportion of the stage population below the poverty level was 14.7 percent (U.S. Census Bureau, City-County Data Book, 1970).

Schools: El Paso County (including the City of El Paso) is served by two separate school districts: The El Paso Independent School District and the Ysleta Independent School District. The fall 1977 enrollment of the El Paso School District totaled 62,116 pupils, of which 5,983 or 9.6 percent were dependents of Fort Bliss military personnel. The 1978 enrollment for the Ysleta School District was 45,578, of which 1,442 or 4.2 percent are dependents of Fort Bliss military personnel.

El Paso County has a total (estimated) excess school capacity of 7,500 pupil spaces. The El Paso School District has an estimated excess capacity 6,000 pupil spaces and the estimated excess capacity of the Ysleta School District is 1,500 pupil spaces (Brown, 1978; Hart, 1978).

Housing: The locus of off-post housing for Fort Bliss military personnel is primarily the county of El Paso. As of early 1978, some 3,757 military families resided within El Paso County (Lopez, 1978).

El Paso is a rapidly growing area and housing starts have increased by 42,244 units between 1970 and 1979. Currently, there are approximately 134,941 housing units in El Paso of which over 18,200 are classified as substandard by U.S. Census definition. As of January 1980, the vacancy rate averaged six percent of standard units or approximately 8,096 units. An average of 650 units are offered for sale each month and approximately 20 percent of the total apartments turnover each month (City of El Paso, 1978; Lopez, 1978).

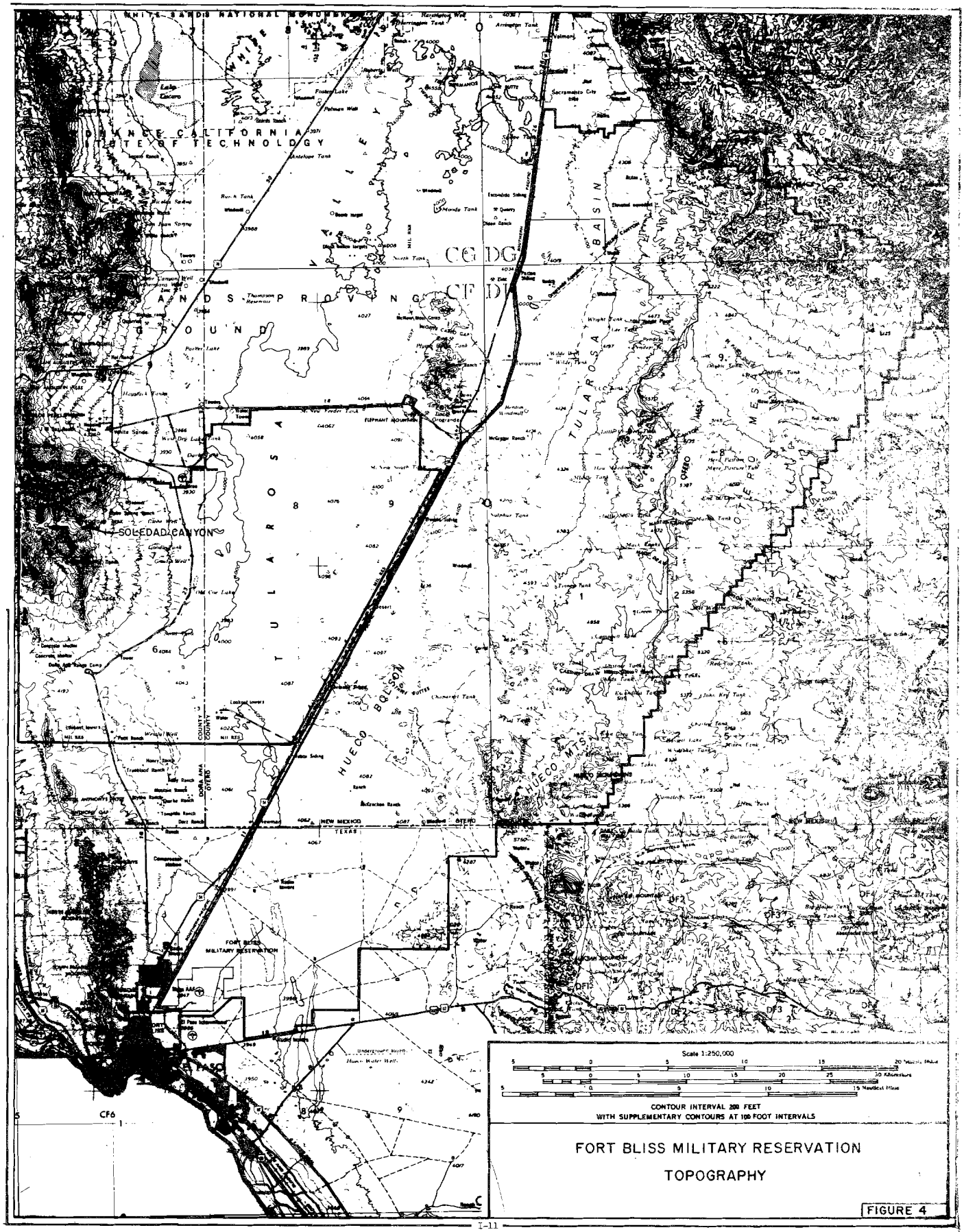
e. Topography: The Fort Bliss Military Reservation ranges in elevation from 3,800 feet to more than 8,000 feet and it is located in eastern Dona Ana and western Otero Counties of New Mexico, and El Paso County, Texas, within the physiographic boundary of the Basin and Range province. See Figure 4 for a topographic map of the installation. Fort Bliss can also be divided into four general topographic zones, each of which has a characteristic relief and soil assemblage. They are as follows:

(1) The Tularosa Valley is a broad, relatively flat desert basin lying east of the Organ and Franklin Mountains and west of the Sacramento and Hueco Mountains and Otero Mesa. The surface of this inter-montane basin is characterized by one to 12 feet high semi-stabilized coppice sand dunes moderately covered with mesquite bushes. Surface elevations in this area range from approximately 4,200 feet on the east, and sloping very gently to the west at about 3,950 feet.

(2) An area of low to moderate relief along the eastern boundary of the area called the Otero Mesa upon which a large portion of the McGregor Range is situated. The Mesa is characterized by a broad, relatively flat, grass covered surface which slopes gently to the east. The Mesa exhibits a sharp, west-facing escarpment which rises steeply from the desert floor. Local relief along this front varies from 300 to 800 feet. The northern part of the Mesa is drained to the east by two arroyos which are tributary to the seasonal Sacramento River which courses through the extreme northeast corner of McGregor Range.

(3) A smooth, relatively small alluvial plain slopes off the southwest flank of the Sacramento Mountains; this northeastern part of the area consists of low coalescing alluvial fans that form a lobate fringe a few miles along the mountain base.

(4) High, rugged, mountainous areas consisting of the Organ Mountains, the Hueco Mountains, and the Sacramento Mountains. The northeast corner of the reservation is within the Sacramento Mountains. These mountains are characterized by a pronounced west-southwest facing escarpment. This escarpment rises abruptly out of the desert floor, attaining a local relief of about 3,000 feet. The northern limits of the Hueco Mountains are located in the southeast corner of the installation. These mountains consist of relatively low, subrounded hills which blend gently into the Otero Mesa on the north. Within the subject area, the Hueco Mountains reach a maximum elevation of about 5,700 feet in the extreme southeast corner of the reservation. The southeastern portion of the Organ Mountains is contained in the western portion of reservation lands and reaches a height of 8,600 feet.

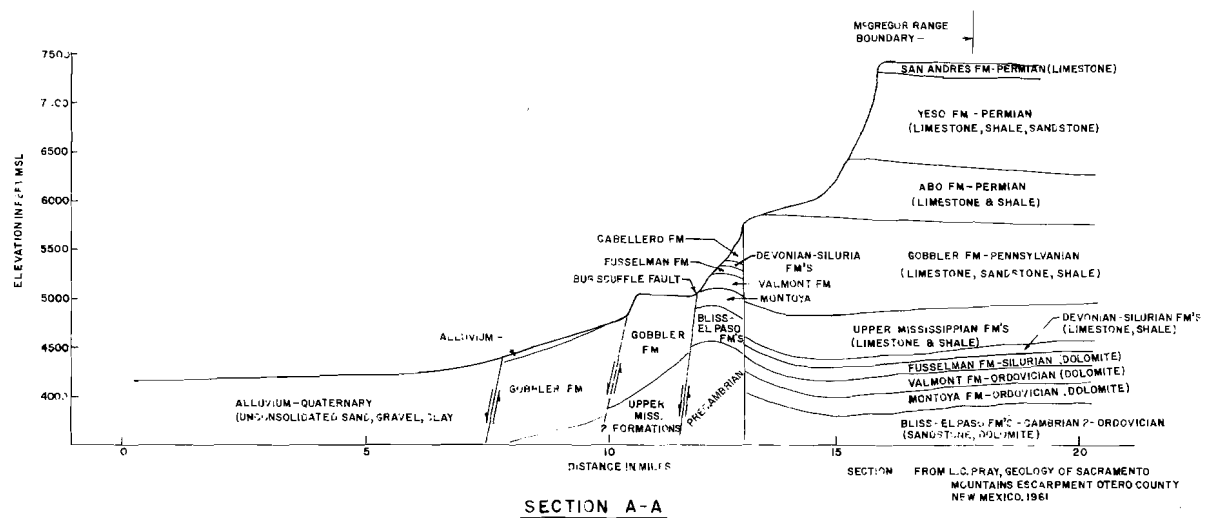

WHITE SANDS NATIONAL MONUMENT
ORANCE CALIFORNIA INSTITUTE OF TECHNOLOGY
SACRAMENTO MOUNTAINS
TULAROSA BASIN
SOLEDAD CANYON
HUECO BOLSON
HUECO MTS.
FORT BLISS MILITARY RESERVATION
NEW MEXICO
TEXAS
DONA ANA COUNTY
OTERO COUNTY
CF6
Scale 1:250,000
CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
FORT BLISS MILITARY RESERVATION
TOPOGRAPHY
FIGURE 4

f. General Geology: The Fort Bliss Military Reservation and surrounding area was essentially a stable, relatively shallow marine shelf from late Cambrian through early Pennsylvanian time. The oldest sedimentary deposits in this area are approximately 400 million years old, and they consist chiefly of dolomite beds which range in age from late Cambrian to late Ordovician (Pray, 1961). Deposition during Devonian time consisted mainly of marine shales and shaly limestones. A relatively thin sequence of upper Mississippian age limestone and shale disconformably overlies the Devonian rocks. Unconformably overlying the Mississippian deposits are approximately 3,000 feet of Pennsylvanian age sediments. These strata consist of limestone, sandstone, dolomite, and shale which were deposited in a quiet shallow marine environment. Tectonic disturbances in Virgilian time (late Pennsylvanian) altered the sedimentation origin from marine to terrestial. The tectonic movement resulted in the subject area becoming a large depression with land masses developed to the east, west, and southwest. In later Pennsylvanian and early Permian time, this depression (Oro Grande Basin, Pray 1961) received a thick sequence of land derived sediments. Most (youngest) sedimentary rocks in the study area consist of limestone strata of the San Andres formation. These sediments mark the return of quiet marine shelf deposition in the area (Pray, 1961). The southern part of the Tularosa Valley is physiographically a bolson and structurally a graben complex.

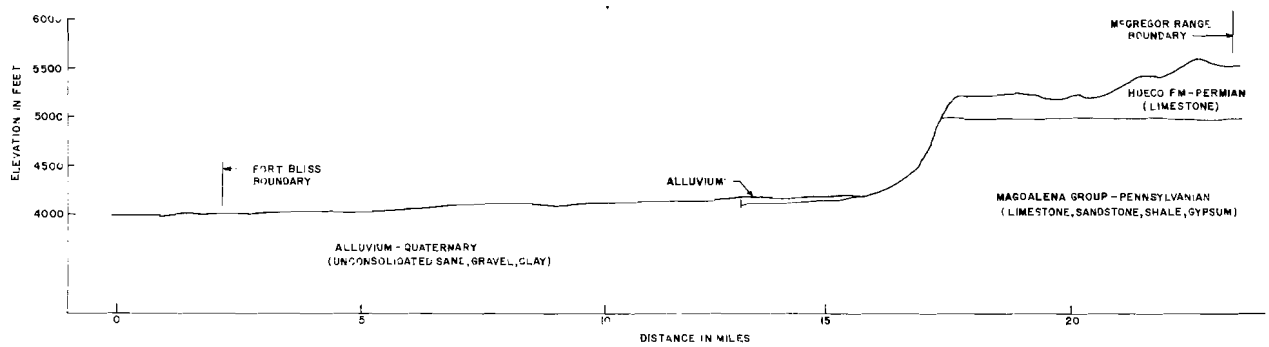
By middle Cenozoic time, the Hueco Bolson and the Mesilla Bolson, respectively on the east and west of the Franklin Mountains, were the prominent basins of deposition. The northern boundary into the Tularosa Valley of these two formations is obscure; however, lacustrine deposits near Culp Canyon possibly are of the Fort Hancock, and the overlaying alluvial fan deposits are probably coeval with the Camp Rice. These preliminary findings, together with other evidence from well cores, suggest that the southern part of the Tularosa Valley has had a history of continuous, closed basin deposition, with Kansas playa complexes possibly united with Lake Cabeza de Vaca and/or Lake Lucero to the north.

Initial field observations of eroded petrocalcic horizons, braided stream deposits alternating with poorly sorted mud flows, relic and paleosoil horizons, topographic expressions of old sediment surfaces and terrace-strand lines, and multiple superimposed petrocalcic (caliche) horizons demonstrate that there have been several periods of alternatively wetter and drier climatic trends during and since the Pleistocene. These are probably related to pluvial-interpluvial episodes and post-Pleistocene climatic instability. See Figures 5 and 6, for a graphic description of the installation's geology.

g. Economic Geology: Many gypsum beds of commercial quality are posed on the gentle slopes of the small cuestas (ridges or plateaus cut away by erosion from the mesa escarpment) below and west of Otero Mesa. They also occur on the steep slopes of the Otero Mesa escarpment in a varied pure form. The Hueco Mountains contain a gypsum deposit of commercial value 25 to 75 feet thick. In the northern part of the reservation, high-purity dolomite deposits crop out near the base of the Sacramento escarpment. These strata contain over 20 percent magnesium. Sand and gravel deposits of value for construction are present throughout the range. These include sand and gravel deposits near the base of the Sacramento-Otero escarpments and in the arroyos in the northern part of Otero Mesa. Limestone and sandstone strata are present near the surface over a large part of the reservation. These rocks are suitable for crushed stone for concrete aggregate, base course material, building stone, etc. The Organ Mountains and portions of McGregor Range have a potential for base and precious metal minerals. Geologic settings in known mining districts north and west of the range bear similarity to geologic environments on the range, and this similarity suggests that the range may contain base and precious metals. There is the possibility that there may be some oil and gas available on the installation. At least 4,800 and 6,400 feet of potential



SECTION A-A



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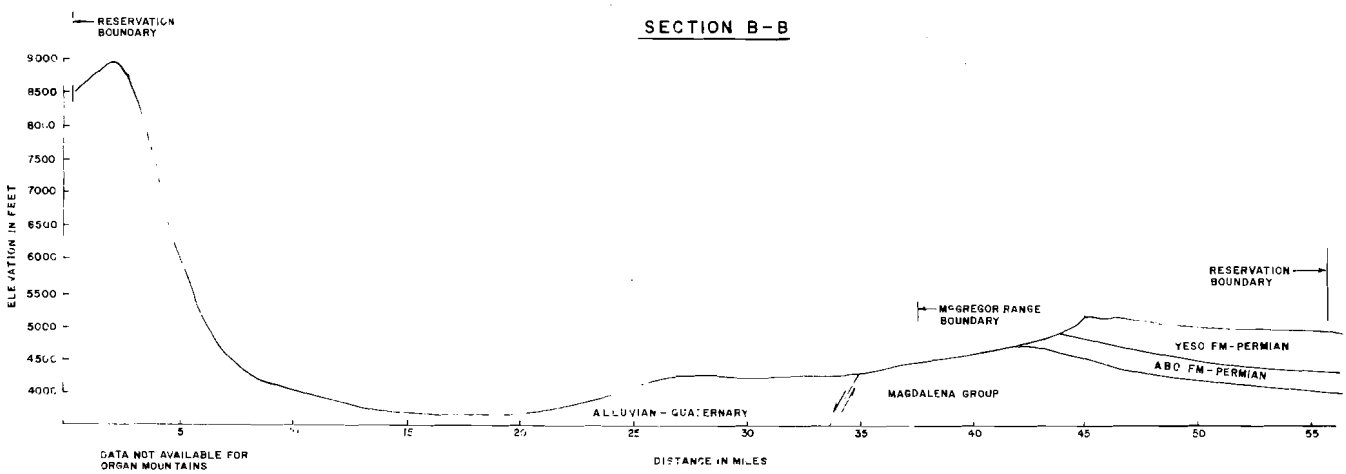
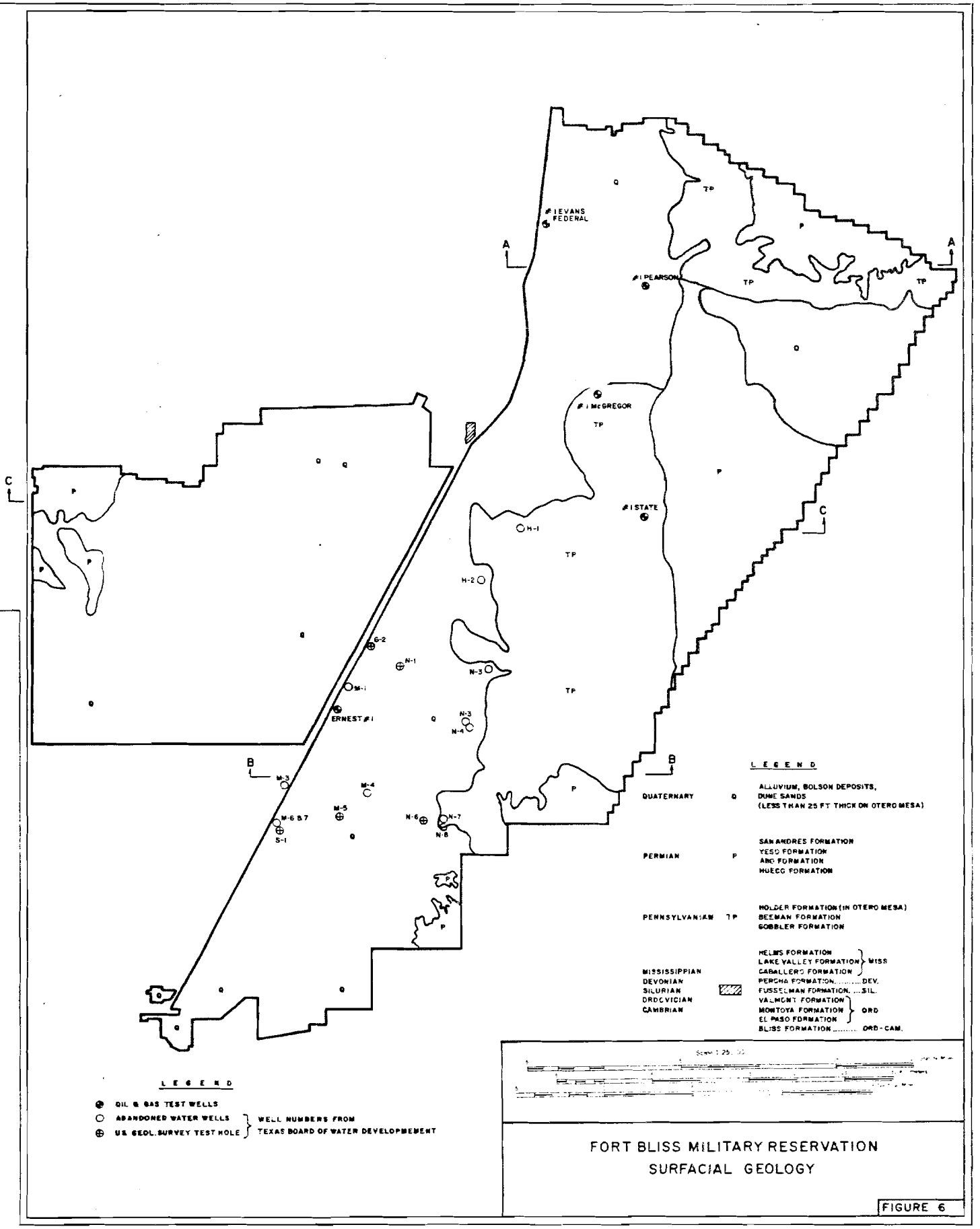


SECTION C-C

FORT BLISS MILITARY RESERVATION

GEOLOGICAL PROFILES

FIGURE 5



FORT BLISS MILITARY RESERVATION
SURFACIAL GEOLOGY

FIGURE 6

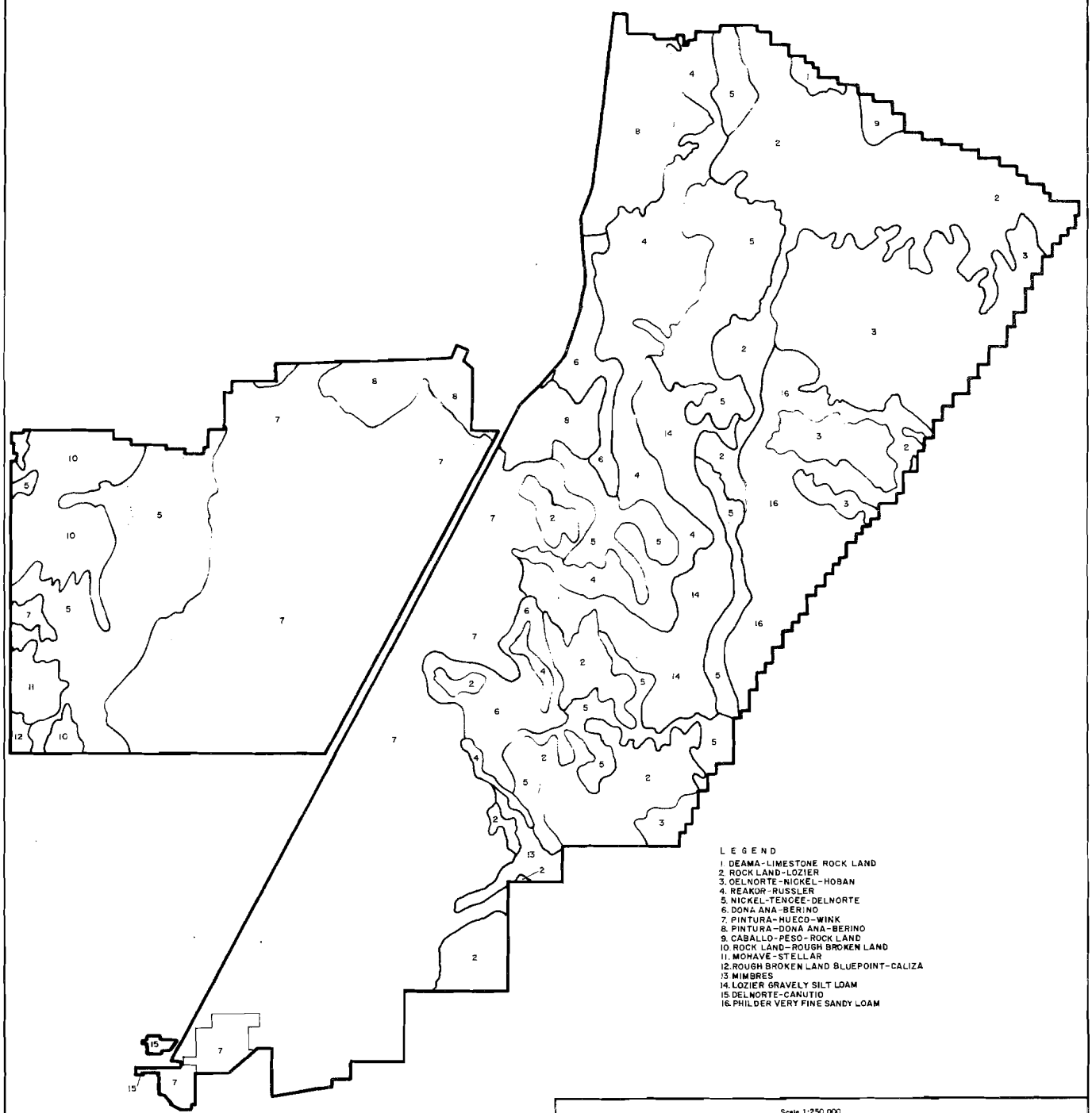
oil-bearing rocks remain untested in the Tularosa Basin and Otero Mesa areas. Five shallow petroleum exploration tests, two of which reported multiple oil and gas shows, were drilled on the McGregor Range portion of the installation prior to occupation by the military. Geothermal energy development may be a possibility on McGregor Range, but it is not known at present if a geothermal reservoir underlies the range.

h. Soils: There is considerable variability in parent material, development, texture, age, and stability of the soils on the installation. All of the soils are a result of weathering of limestone, sandstone, and igneous bedrock, and the intrusion of eolian (windblown) materials from other areas. The soils are mostly calcareous and alkaline, have moderate permeability, and are moderately well drained with the exception of impervious caliche (cemented calcium carbonate) layers or bedrock near the surface in some areas. Soils within the mountainous areas of the installation vary from extremely shallow on slopes to quite deep in some wide canyon bottoms. The soils of Otero Mesa vary from shallow on limestone hills to deep within draws. The majority of Otero Mesa soils are derived from weathering of local limestone bedrock and are fine sandy loams , while alluvial materials from the Sacramento and Hueco Mountains and eolian sands account for a smaller portion of soil parent sources. Soils of the eastern third of the Tularosa Basin portion of the installation (below Otero Mesa) have developed in alluvial fan materials and range from gravelly loam on the higher fans to clay loams on the fringes of fan toes. These soils have high potential for water-induced sheet and gulley erosion. Soils of the central and western portions of the basin have formed in eolian sand deposits. These soils are generally underlain by caliche. Much of this area consists of wind blown sand which has formed into round or linear coppice and parabolic dunes up to 12 feet high and which are semi-stabilized by mesquite bushes. Interdune areas have been eroded down into consolidated argillic B horizons of soils formed in the late Pleistocene/early Holocene prior to the onset of erosive conditions, and occasionally down to the caliche layer. Large areas of deep, undulating sands partially stabilized by vegetation occur within duned areas. Strong winds are generally to the northeast, and net sand movement and dune orientation are in this direction. Both dunal areas and undulating sand sheets are prone to wind erosion if stabilizing vegetative cover is removed or soil surface crust is broken. See Figure 7 for an overview of soil types and location.

i. Seismic Conditions: The area under consideration is located in an area of moderate activity (Sanford, Alan R., 1974). Earthquake data yield estimates for the strongest earthquake in a 100-year period of a magnitude of 4.8 and 6.0 (Richter Scale).

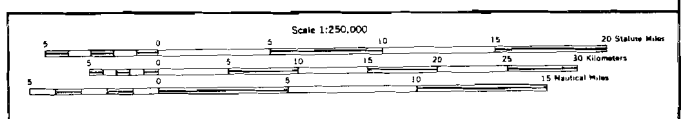
j. Surface Water: Permanent water sources exist within the Organ Mountains portion of the installation. These include several small streams and many seeps, springs, and pools. These serve as important wildlife watersources and provide unique mesic habitat for both vegetation and wildlife.

Manmade surface water resources have been developed in the northeastern third of Fort Bliss to support cattle grazing operations and wildlife management programs. This water originates in the Lincoln National Forest which adjoins the northeast boundary of Fort Bliss. Rights to this water were obtained by the Army with the acquisition of fee owned lands in McGregor Range in 1957. Of the total 110,000 gallons per day entitlement, 60,000 is supplied by Carrizo Springs; 50,000 by the Sacramento River. These waters are distributed by means of pipelines over the northeast portion of the reservation, and during the dry season, are the only source of water in the area for wildlife.



SOURCE DOCUMENTS:

1. SOIL SURVEY OF EL PASO COUNTY, TEXAS, SOIL CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH TEXAS AGRICULTURAL EXPERIMENT STATION.
2. SOIL ASSOCIATIONS & LAND CLASSIFICATION FOR IRRIGATION, DONA ANA & OTERO COUNTIES, NEW MEXICO, AGRICULTURAL EXPERIMENT STATION IN COOPERATION WITH WATER RESOURCES INSTITUTE AND SOIL CONSERVATION SERVICE.



FORT BLISS MILITARY RESERVATION

SOIL ASSOCIATIONS

FIGURE 7

Numerous seasonal playa lakes of various sizes may be found scattered throughout the desert basin areas and serve as a source of water only during periods of heavy to moderate precipitation (summer months). Intermittent streams, handling channelized runoff, drain the mountainous areas and are subject to flash flooding. Water in these ephemeral streams quickly dissipates by seepage into the ground or by evaporation. No streams flow off the reservation.

The City of El Paso obtains about six million gallons of water annually from the Rio Grande. This constitutes about 11 percent of the total water supply system.

k. Ground Water: Essentially all of Fort Bliss' water is supplied by means of deep wells located in the so-called Hueco Bolson, a geological region in the southern half of the Tularosa Basin. The geological and hydrological conditions are described in detail by Knowles and Kennedy (1958) and Rapp (1957). The Hueco Bolson geology can be divided into two consolidated Bolson deposits: 1) the valleys, and 2) the low lands. The deposits — layers of clay, sand and gravel of tertiary age —— have been formed from the weathering of rocks in the surrounding mountains and subsequent transportation to and deposition in the valley. The deposits are generally finest grained with low permeabilities in the Central portion grading to more cored deposits and higher permeabilities near the mountains. In short, the Bolson is a grabben type fault which has filled primarily with fluvial and lacustrine deposits.

With the exception of a major structural trough, the depth of the deposits ranges from a knife edge to 4,900 feet in the Central part of the Bolson. The maximum thickness of the Bolson fill occurs to the west of the reservation within a 9,000 feet deep structural trough which parallels the base of the Franklin Mountains.

The depth to the ground water table, which is generally deep, varies throughout the area. Measured depths range from almost 265 feet to 350 feet. Potable water is obtained from two locations on the reservation — The main cantonment area includes the Tobin Wells field (Table 1) and the Dona Ana Range Camp. Water for McGregor Range Camp is piped approximately 20 miles from the City of El Paso. Water consumption by Fort Bliss averages a little over three billion gallons per year. Approximately one-third of this amount is purchased from the City of El Paso, Texas. The U.S. Geological Survey estimates the Hueco Bolson to contain approximately 10,663,000 acre feet of fresh water (Meyer, 1976).

With the exception of the Hueco Bolson fresh waterbearing aquifers in the main cantonment and Dona Ana Range Camp areas, ground water underlying the reservation is highly mineralized and is of poor or marginal quality. Historically, attempts by ranching, mining, and railroading interests to obtain potable ground water in the upland areas of the reservation have not been successful. The concentration of chlorides, sulfates, and total dissolved solids (TDS) often exceeds the U.S. Public Health Service Drinking Water Standards of 1974. In 1957, the U.S. Geological Survey, at the request of the Corps of Engineers, made a study of the ground water conditions around McGregor Range Camp seeking a source of water for the camp. Rapp (1957) reported the results of this study. A summary of the quality of the water that was found is in Table 2. In all the wells, the chlorides and the TDS exceeded the U.S. Public Health Service recommended standards of 250 milligrams per liter (mg/l) and 500 mg/l respectively. In well T-1, drilled at McGregor Camp, the sulfates were within the recommended standard of 250 mg/l. Well T-2 was drilled about four miles east of McGregor Camp and the contractor's well was about one and one half miles east of Well T-2 just northeast of McGregor Camp. The contractor well was drilled down 745 feet and into bedrock, and this accounts for the high TDS, 8,900 mg/l, and a temperature of 142 °F. Most of the recharge for the ground water is from runoff from the

surrounding mountains percolating through the alluvial deposits at the base of the mountains. Local recharge from precipitation falling on the range is probably limited to the depressions in the ground surface that penetrate the impervious caliche that underlies this area at a shallow depth.

TABLE 1

QUALITY OF THE GROUND WATER FROM TOBIN WELLS

(Data from the USAEHA Drinking Water Quality Analysis, 1983)

	mg/l
Total dissolved solids	336
Total solids	336
Calcium	22
Magnesium	7.0
Sodium and Potassium as Sodium (Na)	90
Sulfates (SO_4)	54
Chlorides	69
Bicarbonates (HCO_3)	154
Carbonates (CO_3)	0
Nitrates (NO_3)	1.86
$CaCO_3$ Alkalinity	126
Iron (Fe) dissolved	0.02
Fluorides	1.0
Total hardness at $CaCO_2$	85

TABLE 2

CHEMICAL QUALITY OF GROUND WATER NEAR McGREGOR CAMP

WELL	CHLORIDES-mg/l	SULFATE-mg/l	TOTAL DISSOLVED SOLIDS-mg/l	TEMP. °F
T-1	445	99	1,170	122
T-2	420	1,210	2,620	69
T-5	550	215	1,420	72
CONTRACTOR	4,060	859	8,980	142

1. Utilities.

(1) Water Supply: Fort Bliss is a major user of water in the El Paso-Ciudad Juarez area. It obtains its water from wells located in and owned by the post, and from the City of El Paso. In Fiscal Year 1983, Fort Bliss pumped from its wells 1.6 billion gallons (approximately 4,923 acre-feet) of water and purchased from the City approximately 0.7 billion gallons for a total annual consumption of more than 2.3 billion gallons (approximately 7,077 acre-feet). The Army owns and controls approximately 44 percent of 150 square miles in the Hueco Bolson aquifer area, from which an estimated 13 wells produce little more than 5,000 acre-feet per year. Thus, 21 percent of the post's water supply originates with the City of El Paso.

The City of El Paso obtains its water from three sources: the northwestern part of the Hueco Bolson Basin, the Canutillo Basin and the Rio Grande River. In 1983, the total amount of water supplied by the El Paso Water Utilities Public Service Board, was 33.62 billion gallons (103,165 acre-feet). The sources and amounts withdrawn from each were as follows (El Paso Water Utilities Public Service Board, 1983):

Hueco Bolson - 20.90 billion gallons —— 64,318 acre-feet - 64%

Rio Grande - 6.68 billion gallons —— 20,552 acre-feet - 11%

Canutillo - 5.95 billion gallons --- 18,295 acre-feet - 25%

Only minimum recharge occurs in the area (estimated at about 155 million gallons annually) causing continuous decline in water levels amounting to about 35-45 feet since 1903 (Meyer, 1976). A model constructed by the U.S. Geological Survey estimated that in 1973 the consolidated deposits in the Bolson contained 10,663,000 acre-feet of fresh water, and predicts that by 1991 that amount will decrease to 9,842,100 acre-feet (Meyer, 1976). Based on total pumpage rates of 71,557 acre feet in 1983 from the United States section of the Hueco Bolson (64,318 acre-feet pumped by El Paso and 7,239 acre-feet pumped by Fort Bliss), the Hueco Bolson Basin could serve as a source of fresh water for many years to come. An important caveat should be introduced, however, in that data as to the pumpage from the Bolson in Ciudad Juarez are not available. Although it is safe to assume the per capita consumption is lower than in El Paso, the sheer size of the town, about 750,000, requires extensive water use, which in turn requires a high rate of pumpage. Also, U.S. Geological Survey data is based on present rates of usage.

The reference base of water storage in the Hueco Bolson refers to fresh water of less than 1000 mg/liter of total dissolved solids. However, beneath the fresh water deposits throughout the Bolson, there exist large deposits of highly mineralized or salty waters, and extensive pumping may result in salt water intrusion into the fresh water deposits. To protect this ground water resource within the Hueco Bolson and to insure an adequate water supply for further development, the City of El Paso is formulating plans which call for a comprehensive water supply program; the program will not rely solely upon the Hueco Bolson but will also look to importation, to recycling, and to the increase use of river (i.e., Rio Grande) water as a measure of achieving an adequate, reliable supply.

(2) Recycling of Wastewater: On July 17, 1979, the Texas Department of Water Resources (TDWR) approved the City of El Paso's plan to build the proposed federally-assisted, 10 million-gallons-per-day capacity Northeast Sewage Treatment Plan (STP), which will include pilot, feasibility sub-project providing for the artificial recharging by well-injected method into the freshwater portions of the Hueco Bolson Aquifer in the El Paso area using eight million-gallons-per-day (mgd) of Northeast STP's 10 mgd effluent stream, treated to the Drinking Water Standards of the Texas Department of Health. (Reference: Texas Department of Health, Division of Water Hygiene, Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems (November 30, 1977).

If extensive artifical recharge of the Hueco Bolson Aquifer proves to be technologically and economically feasible for the El Paso area, it is anticipated that as much as 60 percent of the City of El Paso's total return flow from the municipal sewage treatment plants might be returned to the aquifer. This quantity of injected treated effluent would approximate 25 percent of El Paso's water needs over the next 60 to 70 years. Such extensive recharging of the aquifer would serve to decrease the ground water mining impacts (i.e., pumpage exceeding recharge), approach a stabilization of ground water levels in the aquifer, and delay serious saline-water encroachment into the aquifer.

(3) Availability of Rio Grande Water: Texas Department of Water Resources' records show that the City of El Paso was granted amended Permit No. 1535B, dated August 25, 1969, authorizing the City to receive Rio Grande water of a quantity not to exceed 11,000 acre-feet per year (afy). This permit must be construed and implemented in light of the U.S. Supreme Court ruling made in October 1956, holding that the Irrigation District owned all the Rio Grande water allocated to Texas, including the sewage effluent of the City of El Paso after it is discharged into the Rio Grande. Therefore, the City of El Paso has purchased and continues to purchase water, under contract, with the said Irrigation District. The quantity of available water purchased by the City has averaged approximately 9,800 afy, over the past five years, and this quantity is expected to increase to the permitted quantity of 11,000 afy in future years. However, negotiations to date between the City and the District to obtain increased allotments of Rio Grande water have been unsuccessful.

Because the City of El Paso entered into a contract with the District in 1941, agreeing to own not more than 2,000 acres of water-rights lands in the District area (the Supreme Court held this contract to be valid), it is doubtful that the City of El Paso has authority to condemn and require additional farm lands with appurtenant rights to water from the Rio Grande. The City of El Paso discharges approximately 40,000 afy of treated wastewater effluent into the Rio Grande and the Irrigation District's drainage system, without either monetary or exchange water reimbursements.

The quality of the Hueco Bolson is good and neither the City nor Fort Bliss apply any treatment to this water source, except chlorination. In addition, Fort Bliss' system consists of holding tanks for the settlement of sand particles; pumping into the distribution system is designed through the holding tank.

The water quality is monitored by the Preventive Medicine Activity of William Beaumont Army Medical Center (WBAMC), according to and in compliance with the Federal Law of the Safe Drinking Water Act and the Department of Health, State of Texas, requirements.

(4) Wastewater Treatment: At the present time, the waste water generated from Fort Bliss is being treated by facilities owned and operated by the City of El Paso (Haskill Street Sewage Plant). In the Fiscal Year 1983, about 1.4 billion gallons of wastewater from the post were treated by the City —— that translates into an average of about 3.45 million gallons per day (mgd). In addition to the wastewater treated by the City, 0.220 mgd were treated in different oxidation pounds: (Dona Ana, 0.48 mgd; McGregor Range, 0.149 mgd; Orogrande Range Camp, 0.019 mgd).

Wastewater from Fort Bliss is being treated in the Haskell Street Sewage Plant. This plant has a capacity of 25.8 mgd, out of which about 3 mgd is used by this installation. The present effluent limitation from this plant is 10 mg/liter of BOD_5 and 15 mg/liter of suspended solids.

(5) Electricity: All electricity used on the Fort Bliss Military Reservation, including range facilities and camps, is supplied by the El Paso Electric Company. Annual consumption amounts to approximately 147,167,000 kilowatt-hours.

(6) Heating: Except for isolated range facilities and camps, natural gas is used throughout the reservation to heat facilities. Dona Ana and Orogrande Camps are heated with LPG gas (Propane). Annual consumption of natural gas is approximately 1.6 million cubic feet. Annual propane consumption amounts to approximately 300,560 gallons.

m. Air Quality Emissions: Measurements in the City of El Paso have shown some indications of poor air quality. Monitoring sites located a minimum of four miles from Fort Bliss report that the second highest one-hour concentrations of total suspended particulates in 1976 ranged from 174 to 397 ug/m^3. This is up to 150 percent of the primary standard of 260 ug/m^3 and a 260 percent increase over the secondary standard of 150 ug/m^3. In addition, the one-hour oxidant standard (O_3) of 0.08 parts per million (ppm) was exceeded 0.7 percent of the time (second highest value of 0.14 ppm), while the non-methane hydrocarbon standard of 0.24 ppm was exceeded 87 percent of the time (the second highest concentration was 6.5 ppm) (U.S. Army Environmental Hygiene Agency, 1976).

In 1982, Fort Bliss established a contract with the University of Texas at El Paso to monitor the ambient air on post and to inventory all air pollution sources. Three air sampling stations were set up under the auspices of the Environmental Office, Directorate of Engineering and Housing. Sites were selected in consultation with the El Paso Environmental Office and the El Paso Regional Office, Texas Air Control Board. High volume air samplers (for Total Suspended Particulates, Arsenic, Cadmium, Zinc, and Lead) and Ecolyzers (carbon monoxide) were installed. Samples were obtained every sixth day on "Ambient Day" (i.e., all municipal, state, and federal sites were sampled on that day so a nation-wide network of data are available). Samples were analyzed by the City of El Paso's Environmental Office, using their methodology. A comparison of data obtained in this program with Federal Ambient Air Quality Standards (Texas has adopted the Federal Standards) is shown in Table 3.

The three sampling stations are as follows: Building 11211, located in Biggs Army Airfield; Building 198, Shoppette on Forrest Road and Custer Road; and Building 7304 at WBAMC. In no case did any air pollution concentration exceed the federal standard. The closest to exceedence was the one-hour maximum for carbon monoxide at the Shoppette. In a single hour, the standard was exceeded. However, each station is allowed one exceedence per year.

TABLE 3

COMPARISON OF HIGHEST CONCENTRATIONS OF POLLUTANTS

MEASURED WITH FEDERAL STANDARDS*

POLLUTANT	SITE	CONCENTRATION MEASURED	FEDERAL STANDARD
Total Suspended Particulates	WBAMC	61 ug/m^3/24 h.	
	Shoppette	85 ug/m^3/24 h.	
	Biggs	118 ug/m^3/24 h.	
Arsenic	WBAMC	0.037 ug/m^3/24 h.	
	Shoppette	0.041 ug/m^3/24 h.	
	Biggs	0.035 ug/m^3/24 h.	
Cadmium	WBAMC	0.011 ug/m^3/24 h.	
	Shoppette	0.086 ug/m^3/24 h.	
	Biggs	0.013 ug/m^3/24 h.	
Zinc	WBAMC	0.172 ug/m^3/24 h.	
	Shoppette	0.207 ug/m^3/24 h.	
	Biggs	0.199 ug/m^3/24 h.	
Lead	WBAMC	0.155 ug/m^3/qu	
	Shoppette	0.312 ug/m^3/qu	
	Biggs	0.177 ug/m^3/qu	
Carbon Monoxide 4 th qu. 1982	WBAMC	3.3 8 h. max 5.3 1 h. max.	35 ppm 8 h. max
	Shoppette	9.7 8 h. max 13.7 1 h. max.	9 ppm 1 h. max
	Biggs	0.1 8 h. max 0.1 1 h. max.	not to be exceeded more than once a year.
Carbon Monoxide Jan-Sep 1983	WBAMC	0.86 8 h. max 1:73 1 h.max.	
	Shoppette	4.23 8 h. max 7.73 1 h.max.	
	Biggs	1.30 8 h. max 3.13 1 h.max.	

*Federal Standards and Texas Standards are the same

M^3 = Cubic meter air; ug= micrograms; ppm = parts per million.

Waste disposal activities at Fort Bliss do not result in large pollutant emission (See Table 4), but a pathological incinerator at the hospital, which disposes of approximately two tons per year, has been observed to produce dense smoke during start-up operations due to inadequate draft (U.S. Army Environmental Hygiene Agency [USAEHA], 1976). In addition, there are presently noticeable amounts of fugitive emissions (i.e., visible dust) from military vehicles operating on unpaved roads or over unvegetated terrain.

Volatile fuel storage facilities at Fort Bliss are in compliance with all applicable standards and do not present any large air quality problems. Table 4 shows the extent of hydrocarbon emissions from the installation, which are small relative to total hydrocarbon emissions throughout the El Paso area, but, nevertheless, do contribute somewhat to the observed high hydrocarbon concentration.

Nonetheless, because of the poor air quality of the El Paso area, Fort Bliss is in a designated PSD area with respect to SO_2 and NO_x, while it is in a nonattainment area for particulates and oxidants. Therefore, any new stationary source emissions would be subject to restrictions.

TABLE 4

AIR POLLUTANT EMISSIONS, FORT BLISS

(tons/year)

POLLUTANT	FUEL COMBUSTION	WASTE DISPOSAL	P.O.L. STORAGE	VEHICLES[+]
Particulates	4.3	1.6	--	20
SO_x	0.8	0.2	--	42
CO	18.0	2.0	--	1,629
HC	6.5	1.2	280	167
NO_x	64.9	0.2	--	464

Source: U.S. Army, Fort Bliss. December 23, 1975. Air Pollutant Emissions Report, OMB 158-R75.

[+]Assumes 4,840 mi/yr military wheeled vehicles, 2,420 mi/yr military tracked vehicles, 2,520 mi/yr civilian commuters on-post.

n. Ambient Noise.

(1) Introduction: There are many diverse noise sources associated with normal installation activity which have the potential to contribute to the general ambient noise levels existing outside the boundaries of the installation. These sources include: rotary-wing aircraft, fixed-wing

aircraft, missile firings, artillery firings, and the operation of wheel and track vehicles. Each noise source contributing to the general environmental noise level must be considered as a separate entity. The effect of this source must then be quantified in terms of an identified level which is then combined with all other noise sources to produce an overall composite level. In accordance with the criteria selected by USEPA and endorsed by representatives of the Department of Defense, the descriptor chosen for purposes of this environmental noise assessment is l_{eq} (24) and L_{dn}.

(2) Assessment Procedures: During March 1975, a five man team from USAEHA spent two weeks at Fort Bliss in order to obtain noise emission data, as required, for the analytical procedures discussed throughout this report. Primary instrumentation for the data collection and reduction included the Bio-Accoustics Division mobile accoustics laboratory, Bruel and Kjaer precision sound level meters, and Nagra SJ tape recorders. Seven remote stations were established for monitoring of community noise levels. Real-time data sampling and processing hardware, interfaced to a minicomputer and installed in the mobile laboratory, was used to obtain statistically representative 24-hour environmental noise levels. Remote stations multiplexed to the minicomputer were supplemented by tape recordings of community noise levels as the mobile laboratory was relocated at various sites on and about the McGregor Range area. Noise emission data for specific sources were obtained through the use of several monitoring stations and the mobile laboratory whenever possible. These data were performed using the data processing system and rela-time analyzer installed in the mobile laboratory. The U.S. Army Environmental Hygiene Agency's report entitled Environmental Assessment of McGregor Range (New Mexico) Fort Bliss, Texas, March — July 1975 is available from the Directorate of Engineering and Housing, Environmental Protection Office, Building 1160, Fort Bliss, Texas. The results of this analysis are discussed in the following sections.

In February through March 1982, USAEHA conducted a special study of the Van Horne Park Housing Area. The purpose of the study was to assess the noise environment in the Van Horne Park housing area. Essential findings were that the southern section of the Van Horne Park Housing area is severly impacted by the noise environment. Requirements were to gather additional noise measurements to map the clearly and normally unacceptable noise zones in the Van Horne Park. A follow-up study was done in April 1983, in order to obtain the necessary data to map the unacceptable noise zones; this report has not been finalized to date.

In July 1983, a team from the U.S. Army Corps of Engineers, Construction Engineering Research Laboratory (CERL) studied the propagation of blast noise on Fort Bliss. The results of this study will be used to improve the capability to predict the noise environment around Army installations for the Installation Compatible Use Zones (ICUZ) program.

(3) Noise from Aircraft Operations: Through the use of operational information and aircraft noise emission data, a comprehensive analysis was undertaken to determine the environmental noise of each type of aircraft in each category of operation. These individual contributions were then combined to determine an overall environmental noise association with each type of flight operation.

(a) Range Surveys: Based on operational data and the flight path defined for a full range sweep operation, there is no possibility of hearing damage to residents of nearby communities. Moreover, if the current minimum altitude of 300 feet is observed, analysis indicates there should be no adverse reaction from the community with regard to activity interference or annoyance.

(b) Tracking Missions: The flight paths and courses, as presently defined, preclude any hearing damage or annoyance from aircraft with two exceptions. These are the F-100 (no longer used at Fort Bliss) and f-111. Using worst case conditions of minimum altitude, maximum operations, and proximity to U.S. highway 54, analysis indicates that for all aircraft courses except for low altitude flights from Alamogordo to McGregor Range, the noise from these two aircraft will be less than the ambient noise level which is typical of the towns of Orogrande and Newman. These are the only communities on the western border of McGregor Range. For these low flights, the L_{dn} value for a single day may exceed the existing ambient L_{dn} value by 7 decibels (dB).

(c) Field Exercises and Maneuvers: Field training exercises and maneuvers do not occur on a daily basis. However, due to the massive number of aircraft involved and the great number of operations undertaken, the overall effect must be considered. The joint training exercise known as "Gallant Shield," undertaken during the month of April 1975, served as a basis for determining peak aircraft operations, as well as weapons firings and vehicle operations. The justification for using this particular exercise is simply the fact that it was the largest ever to occur on Fort Bliss ranges. Hence, the effect of "Gallant Shield" in terms of noise would be at least as great as any other comparable exercise of lesser magnitude. As there are no prescribed flight patterns during these exercises, operational data incorporated in the analytical procedure were generated on a statistical basis. The results show that even during peak activity there is no indication of complaint behavior from the community. This is further substantiated by the fact that the existing ambient levels are exceeded at the installation boundaries only when extensive helicopter operations occur within 2,000 feet slant distance from the noise source (helicopter) to the noise receptor (point on ground)

(d) General Operations: The remaining categories of aircraft operations include: medical evacuation, game survey, gunnery, training, fire fighting, and observation flights. These operations can all occur anywhere on the range. Hence, the analysis was undertaken using peak activity and the area adjacent to U.S. Highway 54, as a point of impact. The results of this procedure indicate that at a distance of 2,000 feet (slant distance) or more from the residential areas, peak aircraft activity in these catagories would not produce a noise level in excess of current noise levels at the point of impact (U.S. Highway 54).

(4) Noise from Missile Firings: Launch and impact noise data were collected by a field survey team for all types of missiles and targets fired at McGregor Range. Analytical procedures were then employed to determine distances from point of source required to prevent hearing damage and activity interference. The results of this analysis indicate that only personnel in the immediate lauch or impact areas have the potential to be exposed to hazardous noise levels. Current safety procedures insure that these personnel are provided hearing protective devices, and that they maintain sufficient distances between themselves and the noise sources as to preclude hearing damage. Additionally, analysis indicates that missile firing noise will be attenuated to such a degree that anyone more than about three miles from the missile firing and impact sites will experience no annoyance from noise resulting from these activities.

(5) Noise from Weapons Firings: Weapons fired on Fort Bliss include small arms (7.62 millimeter rifle), automatic weapons (M-20 machine gun), air defense artillery automatic weapons (20 millimeter M163 Vulcan, 40 millimeter M42 Duster) and field artillery weapons (105 millimeter, 155 millimeter, and 8 inches).

(a) Small arms firing is conducted primarily on Meyer Range (see Fort Bliss Land Use Map) which is located approximately 10 miles east of U.S. Highway 54 and north of the Texas-New Mexico State Line, and approximately 30 miles northeast of the Fort Bliss main cantonment area. Weapons fired include the 7.62 millimeter rifle and the M-60 machine gun. Only personnel in the immediate vicinity of the point where the small arms are fired are exposed to high noise levels.

(b) Field artillery weapons, air defense artillery automatic weapons, and small arms and machine guns are all fired on the Dona Ana firing range complex. These ranges are located approximately 20 miles north of the main cantonment area, and approximately five miles north of the reservation boundary (see Fort Bliss Land Use Map, Figure 3). The U.S. Army Environmental Hygiene Agency conducted field studies analyzing noise emissions from the 155 millimeter howitzer firings on Dona Ana. The results indicated that the noise was scarcely audible at the reservation boundary intersecting War Highway 11, and not audible at the intersection of Highways 404 and 11 (approximately four miles from the reservation boundary). The U.S. Army Environmental Hygiene Agency's noise study entitled Environmental Noise Pollution Assessment Special Study No. 34-0897-77, Environmental Noise Impact of Fort Bliss Operations, Fort Bliss, El Paso, TX, 16-19 August 1976, is available from the Directorate of Engineering and Housing, Environmental Protection Office, Building 1160, Fort Bliss, Texas.

(6) Noise from Vehicle Operations: Noise from vehicle operations is at the maximum during peak vehicle activity, which would occur during a joint training exercise, such as "Gallant Shield." Exterior noise levels from wheel or track vechicles are not sufficiently high to produce a potential for hearing damage in surrounding communities. Moreover, consideration of all vehicles participating in "Gallant Shield" has shown that even with as many as 10,000 vehicles operations in a single 24-hour period, the minimum distance from the noise source required to preclude annoyance is approximately 2.6 miles. It is important to emphasise that these figures reflect calculations based on 10,000 daily operations within the 2.6 mile distance. Typically, exercises of this nature, vehicle operations would occur anywhere within the installation boundaries. Therefore, these figures reflect worst case conditions in terms of noise impact.

o. Solid Waste: In accordance with Municipal Solid Waste Management Regulations, April 1977, Texas Department of Health, pursuant to the "Solid Waste Disposal Act," Article 4477-7, Fort Bliss must obtain a permit to operate its sanitary land fill from the State of Texas. On November 4, 1982, the State of Texas issued a permit to operate a Type I landfill to Fort Bliss. This landfill also has interim authorization for the disposal of asbestos and infectious waste.

The total volume of refuse generated on the installation (including all ranges) amounts to approximately 10,000 cubic yards (uncompacted) per month. The refuse is collected and disposed of by a refuse contractor who also operates the sanitary landfill. In 1983, Fort Bliss disposed of approximately 42 tons of friable asbestos; documents of the burials are kept at the Environmental Protection Office, DEH. Notification of the burials is sent to the Texas Department of Health, with a copy to the Corps of Engineers, Albuquerque District, for permanent file. The landfill is located just north of the main post area. Land has been set aside in accordance with the installation Master Plan for landfill operation that will meet land fill requirements for the next 100 years.

p. Hazardous Materials: Pesticides, petroleum products, explosives, and other toxic chemicals are used and stored on Fort Bliss. Usage of pesticides is in conformance with Army Regulation No. 420-76, "Pest Control Services" which provides policies, standards, and procedures for pest control of the environment. Usage of these materials is as follows:

(1) Pesticides:

*PESTICIDE	TARGET PEST	APPLICATION SITES	UNITS TREATED	AMOUNT USED (Gal/Yr)
Anticoag	mice	open ground	86	44
		Post Exchange	398	
		Acres treated	68	
Bacthuring	Leafchewer	trees	3466	5751
Baygon	Roaches	Food handling building	1884	1095
		Post Exchange	900	
Chlordane	Ants	Residences	67	295
		Acres treated	90	
Diazinon	Roaches	Acres treated	60	
	Ants	Residences	10166	5467
	Ticks	Recreational Areas	810	
		Hospitals & Labs	1425	
		Barracks	4101	
		Offices	2520	
Malathion	Lice	Residences	571	1472
	Roaches	Warehouses	894	
	Food Pest	Food Handling Building	387	
	Filthy Fly	Offices	390	
	Scorpions	Residences	428	
	Mosquitoes	Kennel	56	
	Spiders	Sparcely wooded areas	120	
	Wasps	Barracks	142	

* In 1983, Fort Bliss also disposed of approximately 150 tons of infectious waste from William Beaumont Army Medical Center.

(2) Petroleum Products:

FUEL	AMOUNT USED
Gasoline*	9,577,000 gal/year
Avgas	0 gal/year
JP-4	550,942 gal/year
Solvent	35,000 gal/year
Kerosene	3,200 gal/year
Diesel	2,035,495 gal/year

*Includes Army and Air Force Exchange Service (AAFES) fuel sales for privately owned vehicles. 8,016,000 gal/year, and military usage 1,561,000 gal/year.

(3) The explosive ordnance used on the range varies from anti-aircraft missiles to conventional small arms ammunition and grenades. All explosive activities are stringently controlled. Annual amounts used are unknown.

(4) Few toxic chemicals are used.

MEK	1,000 gal/year
I,I,I, TRICHLOROETHANE	200 gal/year
ACETONE	300 gal/year
BATTERY ELECTROLYTE	4,500 gal/year
TRICHLOROETHELENE	420 gal/year

(5) Hazardous materials listed herein represent a potential contribution to the air pollution problem of the area. However, chances of these materials finding their way into any surface water resource is extremely low, owing to the fact that Fort Bliss contains no surface water resources. The possibility of these materials reaching ground water resources is likewise extremely small due to the 275-foot-plus depth of the water table. Nonetheless, as a safeguard measure, Fort Bliss has in effect a Spill Prevention Control and Countermeasure Plan (SPCCP), as well as an Installation Spill Contingency Plan (ISCP). These plans have been designed to prevent and minimize the damage associated with the accidental release of hazardous substances into the environment. Fort Bliss has in existence 37 facilities involved in the supply and storage of petroleum products. Total storage capacity totals a little over 78,000 barrels. Sludge from the storage tanks are cleaned out periodically and disposed of by the land fill method in a commercial location set aside and marked for this purpose.

The installation Pest Management program is based on pest control that uses suppression techniques which are utilized by certified journeymen, and evaluated by Health and Environmental Activities and DEH

professional personnel, in accordance with command and technical supervision from TRADOC and the U.S. Army Environmental Hygiene Agency. The installation has an effective Spill Prevention Control and Countermeasure Plan and the chemical industry sponsored emergency number has been appropriately posted. Common nuisance pests are treated; these include filthy flies, roaches, ants, elm leaf beetles, mice, bermuda grass, ragweeds, and nightshades.

The installation pest control program, storage of pest control products, golf course maintenance, and all contract activity, is directed by the Land Management Branch Chief, under the Buildings and Grounds Division of the Directorate of Engineering and Housing. Large animal disease control (including plague and rabies surveillance) is performed by the Veterinary Service. Health and Environmental Activities (WBAMC) provides surveillance of arthropods. The installation's Environmental Protection Office, DEH, has surveillance over any endangered or threatened species and any significant prejudicial impact of pesticide use. Pest controllers undergo routine blood cholinesterase level tests and are vaccinated against rabies.

Funding has been requested for a single Entomology Service Center for pesticide storage, mixing, and emergency decontamination; presently, it is located in three metal storage buildings, one concrete-rock building, and two warehouse storage buildings. Most pesticides are stored in buildings with inadequate temperature control and spill retaining measures. Storage buildings have been posted with appropriate fire hazard identification signs and telephone numbers for reporting pesticide accidents. The Plan proposed for corrective action includes construction of new facilities or contracting pest control services to a private organization.

Pesticide usage on the installation is recorded on the Pest Control Summary Report (DD Form 1532) and forwarded to relevant agencies. Pesticides are requisitioned in accordance with Department of the Army Supply Bulletin (SB) 3-40; required pesticides which are not included in SB 3-40 are requisitioned from local sources in accordance with requirements following approval from the US Army Training and Doctrine Command Entomologist. Pesticides at this installation have been carefully selected to provide a minimum number of items with maximum military application and safety.

Effects of pesticide and herbicide application upon area ecosystems are negligible. Application of such materials is made to the interior of buildings at range camps and to domestic landscape/housing areas on the main post. No application is made to undisturbed natural areas. Some impact may occur to beneficial insects, including honeybees. However, there are no known hives, commercial or otherwise, in the areas surrounding Fort Bliss main cantonment area.

No endangered species of plants or wildlife are affected by herbicide and pesticide application. None exist on or near the main post where pesticide applications are made. Applications in range camp areas are confined to the interior of buildings. Similarly, habitat for wildlife in general and endangered species in particular is not affected by habitat manipulation or modification by way of pesticide and herbicide application.

q. Hazardous Waste.

Section 3005 of the Resource Conservation and Recovery Act of 1976, as amended, requires USEPA to announce officially that "Each person, owner, or operator of a facility for the treatment, storage, or disposal of hazardous waste...to have a permit issued to this Section." The U.S. Environ-

mental Protection Agency has established a two-stage program for issuing permits to hazardous waste TSD facilities, consistent with the requirements of Parts 264 and 275 of 40 Code of Federal Regulations.

Fort Bliss obtained interim status; first by notifying USEPA through Headquarters, TRADOC about this activity, on August 8, 1980, followed by the submission of PART A of the Application directly to USEPA on November 11, 1980. USEPA allocated an Identification Number (ID) - TX 4213720101 - to this installation. Later, the Texas Department of Health issued their ID Number 63003. On September 9, 1982, the Texas Department of Health, under their regulation, 325.93(h)(3), Subchapter L, "Hazardous Waste," asked Fort Bliss to submit PART B of the Application.

On June 28, 1983, Fort Bliss submitted PART B of the Application in order to obtain the final Hazardous Waste Generators Permit from the Texas Department of Health.

In June 1983, the Environmental Protection Office, DEH, developed a Hazardous Waste Management Plan, specifically tailored for the installation's mission. This plan was approved by the Commanding General and since then has been fully implemented.

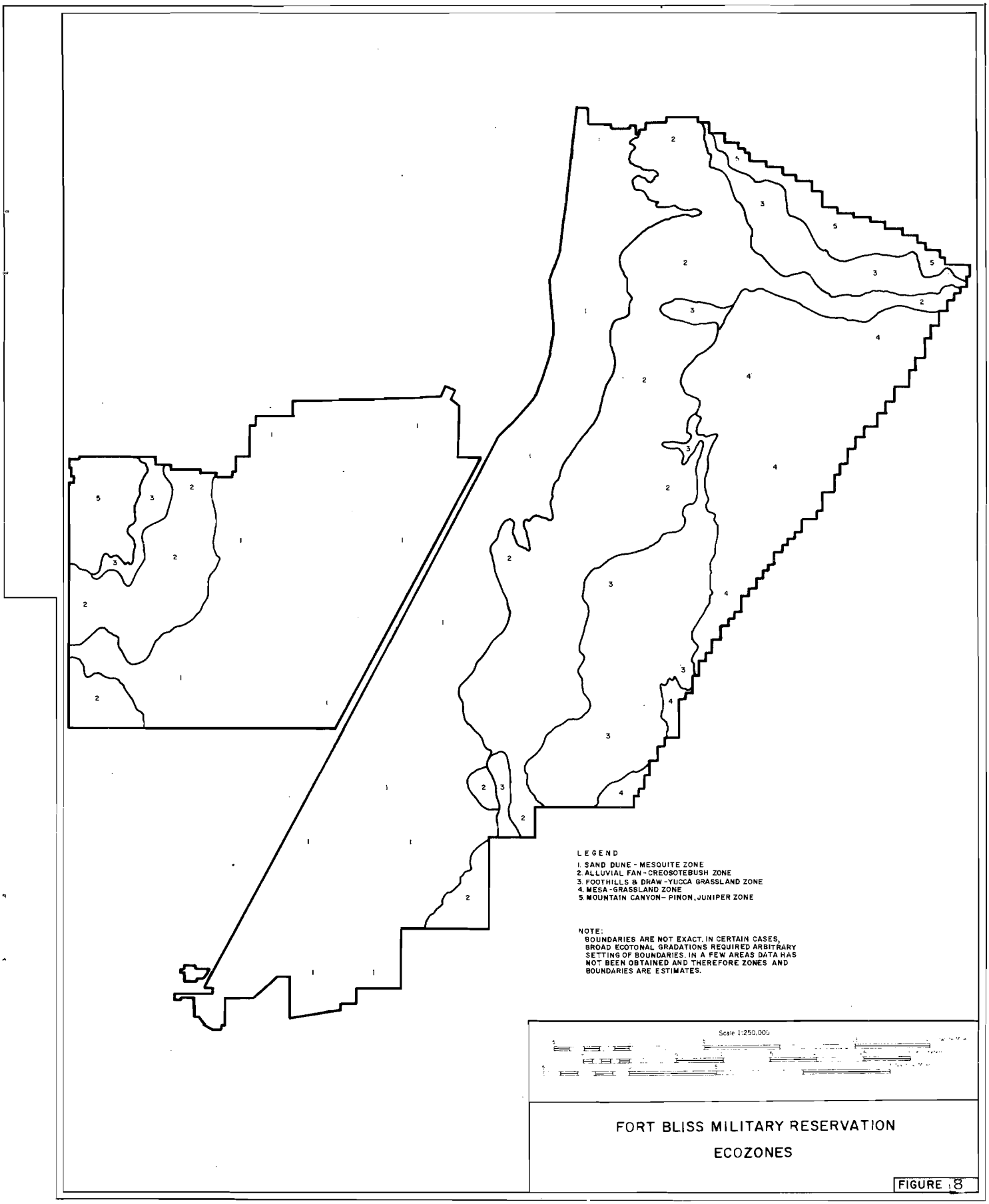
r. Biotic Resources.

The installation lies in the Chihuahuan Desert, an area of generally arid climate. Variation in elevation within the installation (3,900 to 8,600 feet) results in a considerable variance in effective available precipitation. Differences in available moisture are expressed biologically as a variety of vegetational zones. The boundaries of the various zones are not always distinct, and the elevational, topographic, hydrologic, and soil factors create a "patchwork quilt" of vegetation, only describable in general terms. For the purpose of this statement, the installation will be divided into five vegetational zones as defined by a study performed by the USAEHA (1975) for the installation. These are as follows: sand dune-mesquite zone; alluvial fan-creosote bush zone; foothills and draw yucca grassland zone; mesa-grassland zone; mountain canyon-pinyon-juniper zone. See Figure 8 for a generalized representation of these zones.

The Tularosa Valley is a desert basin containing the sand dune-mesquite and alluvial fan-creosote bush zones. The sand dune-mesquite zone is characterized by the presence of mesquite (Prosopis glandulosa) stabilized coppice and parabolic dunes varying in height from one to twelve feet. Soil between the dunes is generally from one to thirty centimeters deep, underlain by caliche. In some areas, large sand fields occur and are generally partially stabilized by vegetation (primarily grasses and annual herbs). Mesquite is replaced by sage brush (Artemisia) in these areas of deep sand.

Some localized areas of rather dense grass cover (basal coverage estimated at 1-3 percent, crown coverage 10-25 percent) are still present in this basin. Black grama (Bouteloua eriopoda) is present where the soil has high silt content and duning is absent, while dropseeds (Sporobolus spp.) are present in sandier soils. Plants commonly found between the coppice dunes are soaptree yucca (Yucca elata) and broom snakeweed (Xanthocephalum microcephalum); a large number of other plants, especially annuals, are often present. Four-winged saltbush (Atriplex canescens) is often found with the mesquite.

The mesquite stabilized dunes provide important habitat for birds, mammals, reptiles, and arthropods. From May through October, the mesquite plant is in leaf and creates shade over the dune, providing a cool, relatively moist habitat for dissection prone annual plants, arthropods, and reptiles. The foliage provides nesting habitat for birds. The sand binding mesquite roots provide a shaded substrate for burrowing rodents, etc., not available in the relatively shallow, exposed interdune soil.


LEGEND
1. SAND DUNE - MESQUITE ZONE
2. ALLUVIAL FAN - CREOSOTEBUSH ZONE
3. FOOTHILLS & DRAW - YUCCA GRASSLAND ZONE
4. MESA - GRASSLAND ZONE
5. MOUNTAIN CANYON - PINON, JUNIPER ZONE
NOTE:
BOUNDARIES ARE NOT EXACT. IN CERTAIN CASES, BROAD ECOTONAL GRADATIONS REQUIRED ARBITRARY SETTING OF BOUNDARIES. IN A FEW AREAS DATA HAS NOT BEEN OBTAINED AND THEREFORE ZONES AND BOUNDARIES ARE ESTIMATES.
Scale 1:250,000
FORT BLISS MILITARY RESERVATION
ECOZONES
FIGURE 8

The alluvial fan-creosote bush zone occurs on the alluvial fans of the Hueco Mountains, Sacramento Mountains, the alluvial fans below Otero Mesa, and on areas of shallow soil overlaying caliche. The vegetation is characterized by the presence of creosote bush (Larrea tridentata). Other common shrubs are whitehorn (Acacia constricta), tarbush (Flourensia cernua), broom snakeweed (Xanthocephalum microcephalum), Agave lechugilla, and Spanish sword yucca (Yucca torreyi). Grasses are absent to rare, and when present, basal coverage is quite low (less than .5 percent). Soil is generally quite thin, from 1-30 centimeters in depth. Arroyos commonly dissect this zone. These support more riparian vegetation, including desert willow (Chilopsis linearis), Krameria parvifolia, and Fallugia paradoxa.

Within the large draws of the Hueco Mountains and on the undulating lands immediately west of and below the Otero Mesa escarpment lies the foothills and draw-yucca grassland zone. This area generally consists of deeper soils (depths greater than 50 centimeters) and having relatively greater silt and clay content than the soils of the dune land. Grass and shrub species diversity and coverage is high. Of the grasses, grama grasses (Bouteloua spp.) dominate, with 3-awns (Aristida spp.) and dropseeds (Sporobolus spp.) common. Yucca elata is quite common, as are all-thorn (Koeberlinia spinosa), cholla (Cylindropuntia spp.), Mormon tea (Ephedra trifurca), and Apache plume (Fallugia paradoxa).

The mesa-grassland zone occurs upon Otero Mesa and, in general terms, is a grassland of quite varying species composition and coverage. Soil types and depths vary greatly; depths of 0-200 centimeters have been observed. Shrubs are not common, although locally encountered species are Yucca elata, Xanthocephalum, Koeberlinia, and creosote bush. Representative grasses are the same as those found on the foothills and draw zone.

The Organ and Sacramento Mountains contain the mountain canyon-pinyon-juniper zone. In addition to pinyon (Pinus edulis) and juniper (Juniperus monosperma and Juniperus deppeana), oaks (Quercus spp.), sotol (Dasylirion wheeleri), mountain mahogany (Cercocarpus), agave (Agave parryi), and sumac (Rhus spp.) are quite common. A few ponderosa pine (Pinus ponderosa) exist on the highest elevations of the Sacramento portion, and ponderosa pine, Douglas Fir (Pseudotsuga menziesii) and maple (Acer spp.) are common in the deep, protected canyons of the higher elevations of the Organ Mountains. Aspen (Populus tremuloides) is also present on the high, steep slopes of a few canyons in these mountains.

Medium to large size wildlife observed on the installation include the following (c=common, o=occasional, r=rare): Coyote, c; gray fox, r; kit fox, r; black bear, r; ringtail cat, o; masked weasel, o; badger, c; skunks, c; mountain lion, o to c; bobcat, c; mule deer, c; desert bighorn sheep, r; pronghorn antelope, c (Otero Mesa). Those wildlife listed as rare or occasional may be locally abundant in suitable habitat but are infrequently seen due to being nocturnal (ringtail cat) or very secretive (mountain lion, kit fox). Black bear may occasionally utilize the Sacramento Mountains portion of McGregor Range. Bighorn sheep have been sighted within the Organ Mountains; these may represent a viable population in these mountains or may be migrants from the herd in the San Andres Mountains to the north of the installation: A large introduced African antelope, the oryx, has been established as a viable and increasing population on White Sands Missile Range, to the north of the installation; an undertermined number of these now utilize and breed within a large portion of Fort Bliss.

s. Endangered Species - Federal

(1) Plants

The information contained in Appendix A of the Draft Environmental Impact Statement of Ongoing Mission, Fort Bliss, Texas, March 1979, is no longer applicable due to acquisition of more accurate data regarding species' ranges. Here follows a revised discussion of those species which are currently listed as endangered or are candidates for such listing and which may be found on the installation.

Coryphantha sneedii var. sneedii - As there was a possibility of this species existing within an artillery impact area, an intensive survey was undertaken over its suspected habitat. Low densities of the plant were located within the western edge of the installation outside of the impact area. This species is currently listed as endangered.

Echinocereus lloydii - Previous comments that this species may exist within the eastern portions of Fort Bliss were in error; no known or suspected population of this cactus apparently exists outside of Pecos County, Texas.

Rosa stellata - As of this writing, this species is as yet only a candidate for listing. No surveys for the species have been undertaken by the installation, and it is not known for certain whether populations exist within installation boundaries. It is known to occupy pinon-juniper habitat within the Sacramento Mountains at elevations of 6,000 to 8,000 feet and may exist in the northern portion of McGregor Range.

Opuntia arenaria - As of this writing, this species is as yet only a candidate for listing. It is known only from deep, sandy soils and sand dunes within the Rio Grande river valley. Its range does not involve any lands administered by Fort Bliss.

Argemone pleiacantha - As of this writing, this species is as yet only a candidate for listing. No surveys for the species have been undertaken by the installation. It has been observed to occur in moist microhabitats within canyons in the Sacramento Mountains above 6,000 feet elevation. The species may occur within the installation boundaries.

(2) Wildlife

Bald Eagle - At least two and possibly three wintering bald eagles have been sighted on the Otero Mesa and the Sacramento Mountains portions of McGregor Range annually since 1979. At least one confirmed sighting of this species occured in the Organ Mountains (1976), and a reliable sighting occured in July 1975 in the Sacramento Mountains portion of the installation.

Peregrine falcon - Sightings of this species have occured during fall and spring months in areas within and adjacent to Fort Bliss and probably represent migratory individuals. An intensive, installation-wide survey for this species was undertaken in 1979-1980. No birds were located, possibly due to the fact that suitable nesting habitat for this species (Organ Mountains and the Sacramento Mountain escarpment) appears to be saturated with nesting populations of golden eagles and prairie falcons.

Mexican wolf - An unconfirmed sighting of a pair of wolves occured on Otero Mesa, McGregor Range, in 1975. No further reliable sightings of wolf-like canids have occured in adjacent areas of Texas or New Mexico. The 1975 sighting could have been reliable; in 1970, several Mexican wolves were shot in Trans-Pecos Texas (Presidio and Brewster counties).

Black-footed ferret - Neither ferret nor ferret sign have been observed on Fort Bliss or adjacent areas. The ferret, however, is a notoriously evasive animal. Although no ferrets have been recorded historically within 90 miles of the installation, the subject area is quite remote and supports sizable populations of prairie dogs, the primary ferret prey. The vast majority of ferret specimens taken in New Mexico were collected by the U.S. Biological Survey between 1900 and 1920. The Survey did not trap on or near the present boundaries of Fort Bliss; even the presence of prairie dog, an exceptionally visible component of the local fauna, went uncollected and unreported in the literature for this period. The existence of ferret on McGregor Range, therefore, cannot be entirely ruled out.

State Listed (New Mexico):

Mottled rock rattlesnake (Crotalis lepidus) - Present in the vicinity of Hueco Tanks State Park, Texas, 4-5 miles south of McGregor Range boundary and two miles west of Maneuver Area II; frequents rocky areas, arroyos, and grassland; likely to be present in the Hueco Mountains of McGregor Range.

Trans-Pecos rat snake (Elaphe subocularis) - A primarily nocturnal snake of probably low population density, found in rough, broken land and mountain foothills and canyons. Known from the Organ and Hueco Mountains and foothills; possibly in the alluvial fan-creosote zone and foothills and draw-yucca grassland zones.

Sonora Mountain kingsnake (Lampropeltis pyromelana pyromelana) - A rare and secretive snake possibly occuring in the Organ Mountains.

Black-tailed prairie dog (Cynomys ludovicianus arizonensis) - Present on the Otero Mesa portion of McGregor Range. This species was declining in numbers in the 1970s possibly from plague. At least one large town (50 active burrows) disappeared and one other decreased by two-thirds. In the past two years (1982-1983), however, two new towns have been colonized and appear to be growing in numbers; and the colony that was reduced in population has surpassed its original numbers and has colonized a nearby area.

t. Historic Resources.

(1) Prehistoric Record

At the present state of knowledge, the prehistory of the El Paso/Fort Bliss region is represented by a chronological sequence of several poorly understood archaeological cultures defined principally with reference to the presence or absence of certain projectile point forms, pottery types, and house forms. These chronologically ordered cultures are summarized below.

Before about 6000 B.C., the archaeological materials in the region represent Paleo-Indian (Early Man) populations. These populations are evidenced by Folsom and other Plano projectile points of the Paleo-Indian period. Early Man populations are thought to have been highly nomadic and primarily dependent on wild plant and animal foods. Several Early Man camp-sites tentatively have been identified on Fort Bliss as a result of extensive survey work performed in the past few years. No Early Man sites in the area have been excavated.

After about 6000 B.C., the area is characterized by materials of the Desert (Archaic) culture. Archaic sites are recognized by the presence of diagnostic projectile point forms and by grinding stones (metates and manos) used in grinding hardshelled plant seeds. Minor use of domesticated plant foods is thought by some to characterize the later part of the Archaic period. Rock shelters of the period were excavated in the Hueco Mountains to the east of El Paso during the 1930s and 1940s. Several open air sites have been identified on Fort Bliss, and several promising rock shelter locations also have been identified during recent survey work.

The Archaic Period ended about A.D. 400-500, according to current dating results. It was followed by the Mesilla Phase of the Jornada Branch of the Mogollon Culture. The Mesilla Phase is characterized by unpainted ceramics and by semisedentary populations living part of the year in pithouse structures. Early assumptions about the Mesilla Phase accepted the proposition that Mesilla populations were farmers, but current data and analytical models suggest a hunting and gathering land use strategy. Farming may not have begun to be an important component of the subsistence strategy until late in the phase.

The Dona Ana Phase extended between about A.D. 1100 to 1200. Surface dwellings are said to have been common, and intrusive ceramics suggest expanded trade compared to the earlier Mesilla Phase. Farming may have become an important component of the subsistence strategy during this Phase. Recent survey data have been used to suggest that Dona Ana Phase land use and social organization were the most complex of any prehistoric period in the El Paso/Fort Bliss region. This suggestion conflicts with earlier assumptions about a less complex Dona Ana Phase adaptation and a gradually increasing cultural complexity developing through the prehistory of the area.

The El Paso Phase is defined for the period A.D. 1200 to 1400. It has long been thought to be characterized by sites composed of blocks of surface rooms, made with adobe walls, arranged into apartment house structures forming villages and towns of various size. It also has been accepted that El Paso Phase populations were principally dependent on farming for their food resources, and that this phase was the most complex of all prehistoric time periods. Although these earlier assumptions may be true, recent survey data suggest that the El Paso Phase may have been much less complex and that the phase may represent a late Mesilla-like adaptation.

Figure 9 shows the extent of archaeological survey work on Fort Bliss as of 1983. A general summary of the survey projects conducted to date is as follows.

SURVEY A: Conducted by the University of Texas at Austin. Final report published in three volumes in 1977.

SURVEY B: Conducted by the University of Texas at El Paso. Final report published in 1977 as Settlement Patterns of the Eastern Hueco Bolson, Publication in Anthropology No. 4, El Paso Centennial Museum, University of Texas at El Paso, Texas.

SURVEY C: Conducted by the University of Texas at El Paso. Final report published in 1978 as Settlement Patterns of the Western Hueco Bolson, Publication in Anthropology No. 6, El Paso Centennial Museum, University of Texas at El Paso, Texas.

SURVEY D: Conducted by the University of Texas at El Paso. Final report to be published soon by Fort Bliss.

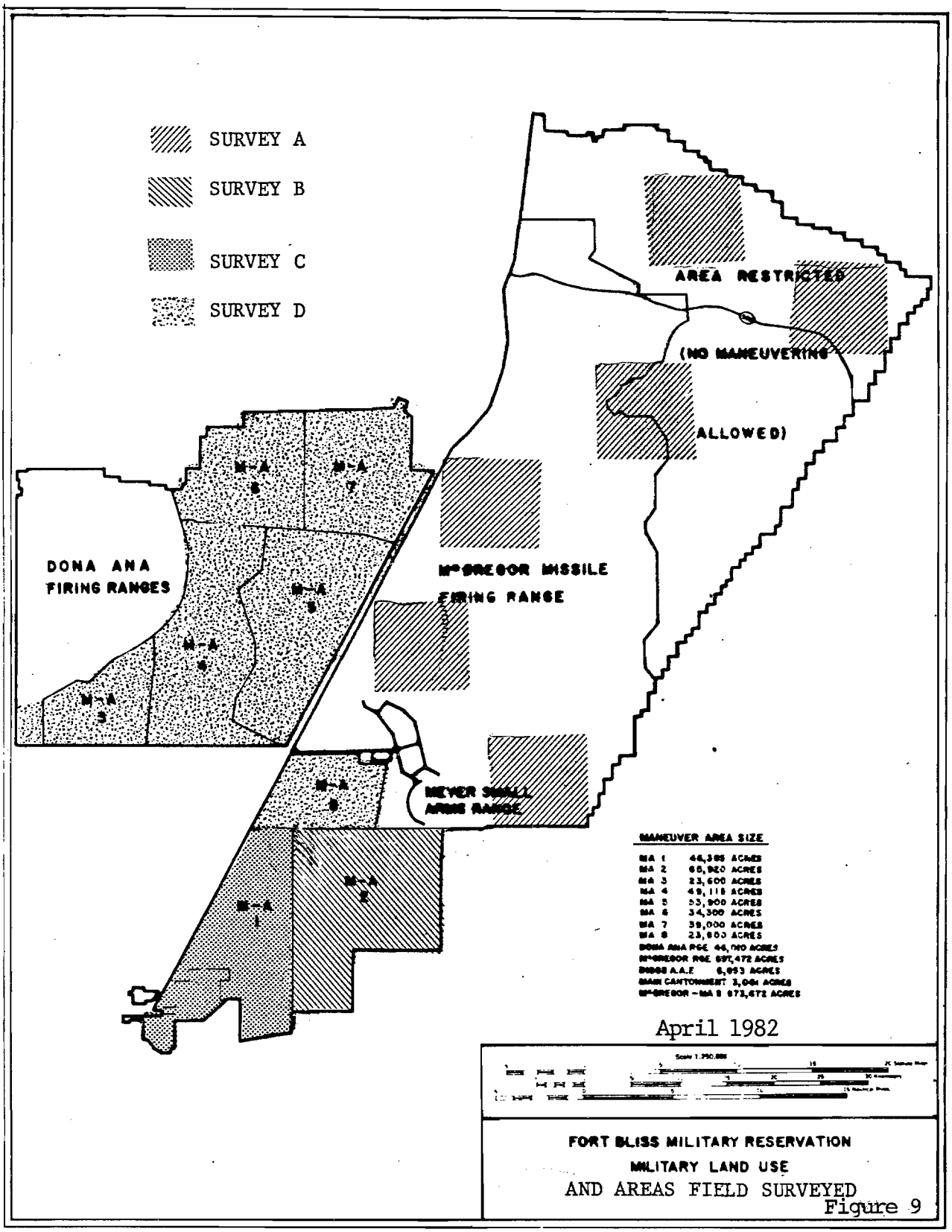

SURVEY A
SURVEY B
SURVEY C
SURVEY D
AREA RESTRICTED
(NO MANEUVERING
ALLOWED)
DONA ANA
FIRING RANGES
McGREGOR MISSILE
FIRING RANGE
MEYER SMALL
ARMS RANGE
M-A 1
M-A 2
M-A 3
M-A 4
M-A 5
M-A 6
M-A 7
M-A 8
MANEUVER AREA SIZE
MA 1 46,385 ACRES
MA 2 65,920 ACRES
MA 3 23,600 ACRES
MA 4 49,118 ACRES
MA 5 53,900 ACRES
MA 6 34,300 ACRES
MA 7 39,000 ACRES
MA 8 23,800 ACRES
DONA ANA RGE 46,190 ACRES
McGREGOR RGE 697,472 ACRES
BIGGS A.A.F. 8,893 ACRES
MAIN CANTONMENT 3,084 ACRES
McGREGOR - MA 8 673,672 ACRES
April 1982
FORT BLISS MILITARY RESERVATION
MILITARY LAND USE
AND AREAS FIELD SURVEYED

Figure 9

Note that the regional prehistory is poorly known and little understood, for professional archaeologists historically have given their attention to other areas of the Greater Southwest. Consequently, there has not been sufficient, well designed study to develop more than preliminary control of chronology and recognition of the different kinds of sites that comprise the long and complex archaeological record of the region.

Given the relative lack of prior archaeological work and the consequent poor state of knowledge of the region's archaeological record, the surveys on Fort Bliss, while intensive, have necessarily produced only preliminary interpretative results. Accordingly, several priority field and analytical projects are outlined in Fort Bliss' Historic Preservation Plan discussed below. These projects will develop understandings of the archaeological record sufficient for the interpretation and protection of sites, and for the eventual identification of those portions of the record appropriate for inclusion on the National Register.

(2) History.

(a) Military: The original Fort Bliss was established in El Paso in 1849. The post was moved to several different locations in subsequent years until it was established at the present location in 1893. None of the pre-1983 versions of the installation are owned by the Federal Government. However, there are two identified, historically significant time periods associated with the present Fort Bliss. Many buildings representative of those periods still exist and still are in use. It is anticipated that some of these buildings eventually will be found to be historically significant for National Register purposes.

The period having priority management concern for the next several years is that of the Mexican Revolution of the early 20th Century, and the development of Fort Bliss as a major horse cavalry post whose mission was to protect the border with Mexico. Events occurring during this time were of substantial significance for the border region and for United States participation in World War I. Fort Bliss eventually became the largest horse cavalry Army post in the United States. The horse cavalry era in the installation's history did not end until 1942.

The other time period for future management concern began with the arrival of Dr. Werner von Braun from Germany and the V-2 missile testing by the United States, initiated at Fort Bliss. Fort Bliss' involvement with missiles continues today with the installation having developed into the largest overland, air defense missile range and training center in the Free World.

(b) Civilian: Substantial civilian settlement on what is now Fort Bliss did not begin until the late 19th Century, when cattle ranches were established in the Tularosa Valley (Map 4). Several ranches were in operation in the Valley when the Army began to acquire lands for military use. Many descendants of the early settlers and ranchers still reside in the El Paso region, and the frontier lore associated with their ancestors is a well developed component of the history and tradition of the era.

(3) Historic Preservation Plan: In response to the complex prehistory and history of Fort Bliss and to legal and regulatory requirements, Fort Bliss has developed and is conducting a comprehensive Historic Preservation Plan. The plan was formulated in response to a memorandum

of agreement developed pursuant to paragraph 800.5 of Part 36 Code of Federal Regulations. This plan has been reviewed and approved by the Commander of Fort Bliss, by both Headquarters Training and Doctrine Command and the Department of the Army, by the states of New Mexico and Texas, and by the Advisory Council on Historic Preservation. Copies of this comprehensive plan are available from the Directorate of Engineering and Housing, Environmental Protection Office, Fort Bliss.

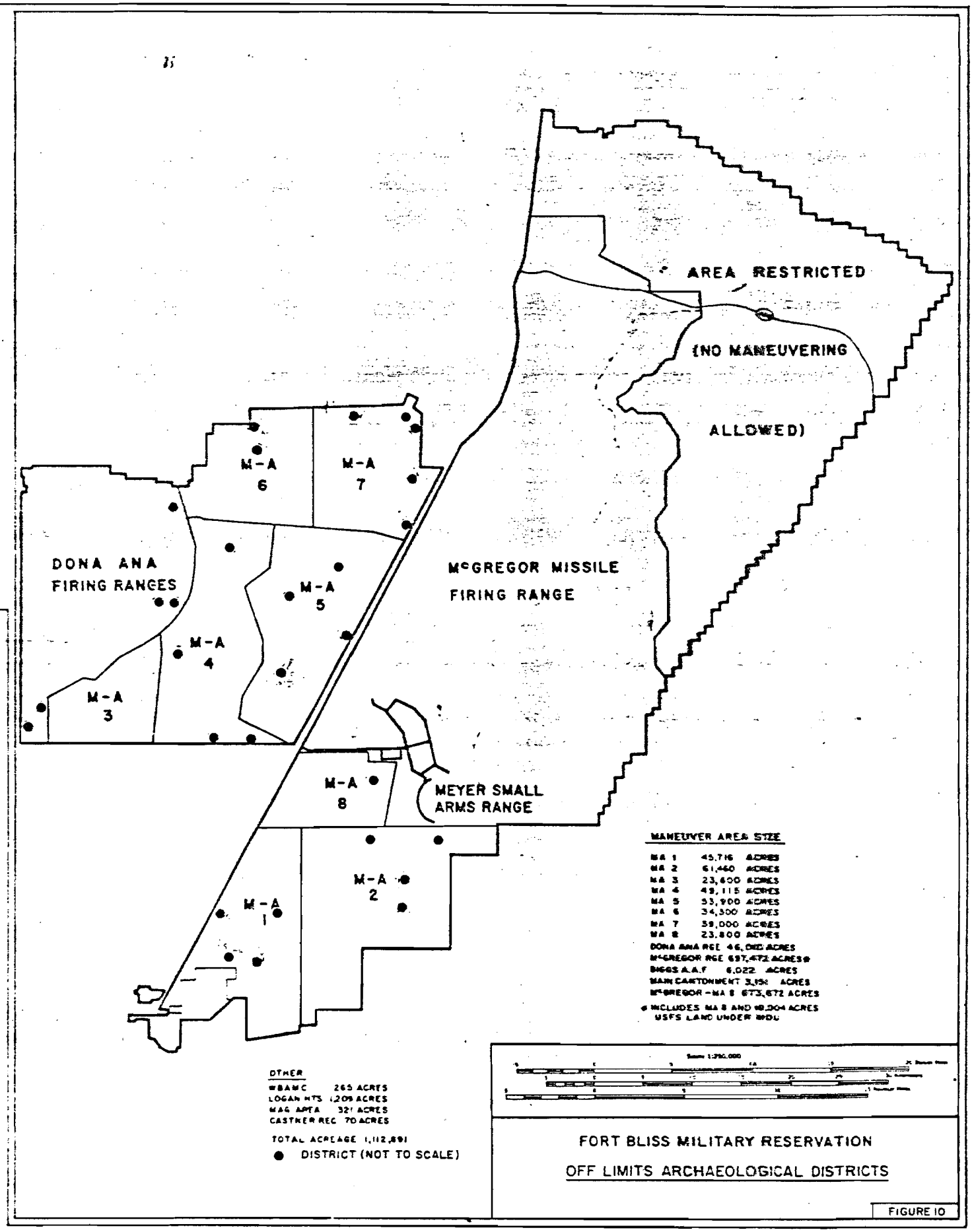
This plan includes a programmatic long-term strategy for field and analytical investigations designed to document and to interpret variability in the archaeological record of Fort Bliss. It also includes a strategy for protection of resources in the context of military training. Protection is provided through identification of off-limits districts which, cumulatively, contain statistically representative samples of the different kinds of sites found on the installation. In cases where proposed construction or new training activities will effect historic properties, the plan requires consultation with the appropriate State Historic Preservation Officer (SHPO) to develop an effective treatment; public input is to be sought when the magnitude of the treatment is thought sufficiently large by either Fort Bliss or the SHPO.

Figure 10 shows preliminary results of the use of survey data in the protection strategy for archaeological resources outlined in the preservation plan. The district areas shown in the figure contain the first results of using available data to define populations of sites and their representative samples. These several areas contain the members of the various samples, all of which have been determined to be eligible for inclusion on the National Register. These areas have been placed off-limits to military field training activities. The boundaries and perhaps the locations of the districts will be updated periodically to reflect new data and interpretations obtained through the efforts of the continuing inventory investigations being conducted in compliance with the preservation plan.

Given the long-term need for field and analytical investigations designed to document and interpret the archaeological record on Fort Bliss, each operational unit on Fort Bliss has been required to develop a Standing Operating Procedure (SOP) for Protection of Historic Resources. The SOPs require that each unit consult with the archaeological staff at Fort Bliss during the design of field training scenarios. During the consultation, the placement of locationally preplanned actions (e.g., antitank ditches, vehicle assembly areas, field operational control centers, and cross-country traffic corridors defined by the design of the training exercise) are adjusted as necessary to keep those activities off of sites that would otherwise be demaged. The experience so far has demonstrated that there is no impairment to military training and that, in fact, training is improved as a result of the more detailed planning required.

The plan also includes provisions that specifically are concerned with the historical resources on Fort Bliss. And, Fort Bliss has funded an investigation of the historical significance of the installation. The study will be used to identify which buildings and groups of buildings on Fort Bliss should be retained in an historical district(s) to represent the historical values of the installation. This study is being conducted by trained historians, and the results should be available soon.

Other results of the plan include a ban on any modifications to the exteriors of buildings more than fifty years of age, pending completion of the historical study of Fort Bliss and identification of buildings to be included in an anticipated district(s).



FORT BLISS MILITARY RESERVATION

OFF LIMITS ARCHAEOLOGICAL DISTRICTS

FIGURE 10

Finally, the historic resources management program has completed field survey of all 400,000 acres of Fort Bliss maneuver area. Over 10,000 archaeological sites have been recorded; and, protected district areas have been defined containing preliminary samples of all cultural periods known to exist on Fort Bliss. Field and analytical projects, which are required to provide the data and information to eventually understand the resources sufficiently well to make effective evaluations, have been identified. Importantly, it has been demonstrated that there is no inherent incompatibility between military training occurring on Fort Bliss and effective management and protection of Fort Bliss' archaeological record. Fort Bliss has the first Historic Preservation Plan approved by the Army and has pioneered a management strategy that is applicable to many other Army installations. Generally, it can be said that Fort Bliss is managing its historic resources effectively.

u. Aesthetics.

The Organ Mountains are the most scenic of the area, due to the side canyons, variety of trees, running water, and colorful igneous rock formations. These also have a wilderness quality about them. The Hueco and Sacramento Mountains, the former treeless, the latter treed, are characterized by spectacular canyons and views of the surrounding areas. Natural, and in some cases, wilderness qualities are found here. The desert basin is monotonous to some, beautiful and photogenic to others, especially during years of heavy rains and resulting flower displays. The entire reservation exhibits the concept of wide, open spaces.

II. LAND USE RELATIONSHIPS.

A. Conformity or Conflict with Other Land Use Plans, Policies, and Controls.

1. Federal, State, and Local.

(a) Federal Programs: The Bureau of Land Management (BLM) and the United States Forest Service administer and manage much of the land in the McGregor Range area. The BLM has a Memorandum of Understanding with the Army providing for co-use grazing on portions of McGregor Range. On McGregor Range, BLM is responsible for livestock management, for the management of wildlife habitat on its lands (Public Law 86-797), and for the maintenance of range improvements. The U.S. Forest Service is responsible for administering its lands for all non-defense purposes. This includes the issuance of all permits for uses and activities which are not related to defense purposes, the protection of lands and resources from destruction by fire and other forms of depredation including trespass not incident to military use, the assessment and collection of fees for the use of lands, and the control of all archaeological activities of the land. A breakdown of land management responsibilities is provided in Figure 11. The U.S. Soil Conservation Service is currently preparing a soils survey of the reservation, and consequently has access to the range when military missions do not limit their presence on the ranges. The U.S. Soil Conservation Service's interpretations of soil limitations will be very helpful to Fort Bliss in determining the most appropriate areas for surface uses of the range, as well as methods to avoid soil disturbance and potential erosion.

(b) State Programs: At the present time, neither Texas nor New Mexico has a state-wide land use plan or policy. An agreement is currently in force with the New Mexico State Game and Fish Commission covering the management of wildlife of New Mexico ranges. Under the agreement, wildlife is hunted in a manner consistent with the Commission's proclamations and regulations.

(c) Regional Programs: The regional governmental agency in Texas which has jurisdiction in the El Paso-Fort Bliss area is the West Texas Council of Governments (WTCOG). The regional governmental agency in New Mexico is the New Mexico Economic Development District. Army operations at Fort Bliss do not conflict with either agency's land use plans, policies, or controls.

(d) Local Government Programs: The only local governmental agencies that could influence land uses at Fort Bliss would be the municipal agencies of El Paso, Texas, and Alamogordo, New Mexico. The land uses of these municipalities are important because their trends and future uses will have an effect upon subsequent land use decisions at Fort Bliss. In some cases and in varying degrees, local government programs conflict with Army land use plans. Specific conflicts are outlined in the following paragraph B.

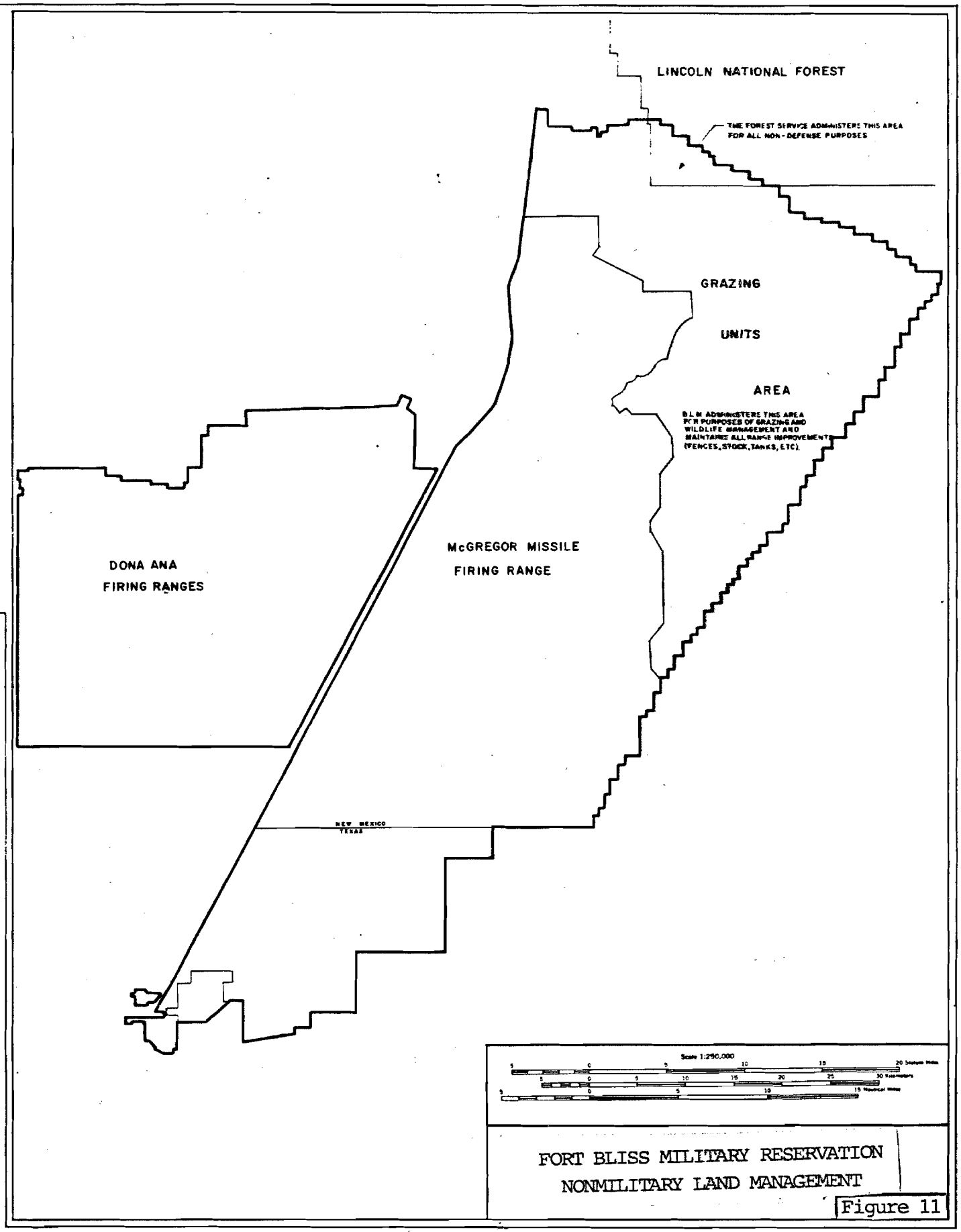
2. Federal Acts.

(a) The Clean Air Act of 1977, as Amended (Public Law 95-95)

Fort Bliss' programs and facilities are in compliance with this act. A discussion of air contaminants expected to result from Army use of the land is included in Section III [Probable Impact of the Proposed Action on the Environment].

(b) National Historic Preservation Act, as Amended (Public Laws 89-665, 91-243, 93-243, and 96-515)

The approval and implementation of Fort Bliss' Historic Preservation Plan brings the installation into compliance with this Act.



FORT BLISS MILITARY RESERVATION
NONMILITARY LAND MANAGEMENT

Figure 11

(c) The Clean Water Act of 1976, as Amended (Public Law 95-217)

Fort Bliss' programs and facilities are in compliance with this act. The impacts on the water quality of area streams and ground water expected from the continued use of the land for Army activities are discussed in Section III [Probable Impact of the Proposed Action on the Environment].

(d) The Resource Conservation and Recovery Act of 1976, as Amended (Public Law 94-580).

Fort Bliss' program and facilities are in compliance with this Act. The impacts on water quality, air quality, and land use from the continued generation of hazardous wastes from Army activities are discussed in Section III [Probable Impact of the Proposed Action on the Environment].

(e) The Toxic Substances Control Act of 1976, as Amended (Public Law 94-469)

Under this act, Fort Bliss' programs and facilities are in full compliance. Impacts on the environment from the management of asbestos, polychlorinated biphenyls (PCBs), and other toxic substances are discussed in Section III [Probable Impact of the Proposed Action on the Environment].

B. Conflicts and (or) Inconsistent Land Use Plans.

Land use conflicts exist on several levels and in specific areas of the installation. These will be discussed by area.

1. Maneuver Area II: Maneuver Area II was originally established during World War II through exclusive use leases which expired in 1946. In 1949 requirements for a maneuver area were established and co-use leases were obtained for a total of 126,000 acres. Later, the lease area was reduced to 65,920 acres and leases were periodically renewed every five years until 1975. At the time, some of Maneuver Area II land owners, feeling that the Army was improperly appropriating their land through incremental but continuous lease condemnation actions, took their cause before the Congress. In response to the action initiated by Maneuver Area II land owners, on June 9, 1976, the subcommittee on Military Installations and Facilities of the House Armed Services Committee in effect disapproved of the Department of the Army's proposal to continue joint use of Maneuver Area II by means of co-use lease arrangement. In lieu of co-use lease arrangements, the subcommittee admonished the Army to undertake vigorous efforts to obtain authority to acquire title to Maneuver Area II. Subsequently, and pursuant to this congressional directive, the Army purchased the privately owned land in Maneuver Area II. The purchase did not include state and railroad lands, currently occupied by the Army under sole-use leases.

2. McGregor Range: McGregor Range was initially withdrawn from public domain land in 1957 under Public Land Order 1470 to support the firings of newly developed air defense missiles. Public Land Order 1470 provided for a withdrawal for ten years with an additional ten-year extension, upon timely application to the Department of the Interior. In 1977, the Department of the Army applied for a new withdrawal for McGregor Range, which segregated the land for two more years. During this two-year extension period, the U.S. Forest Service requested that 18,004 acres of U.S. Forest Service lands which were part of the original withdrawal be excluded from the withdrawal and be the subject of a separate Memorandum of Understanding. An agreement was reached, and in 1979 the Department of the Army filed a second withdrawal application deleting the 18,004 acres of U.S. Forest Service lands. This second application resulted in another two-year extension to the withdrawal process. The Department of the Army has provided the information required under the Federal Land Policy and Management Act of 1976 so that the BLM and the Department of

the Interior can request a new withdrawal action from Congress.

3. Dona Ana—Orogrande Range Complex: The City of Las Cruces has expressed a desire to acquire the Organ Mountains portion (not to include the present live-fire impact area) for a wilderness park.

4. Live-Fire Impact Areas.

(a) Dona Ana—Orogrande Range Complex: On the Dona Ana—Orogrande Range Complex, an area of about 51,000 acres is designated by the installation as an impact area. This includes the Organ Mountains portion of the range and the alluvial fans and foothill portions of these mountains. About half of this is no longer utilized as an impact area.

Post-military use will be affected by these impact areas where unexploded ordnance exists. Almost any nonmilitary land use would require at the least a surface clearance of unexploded ordnance. Only very restricted land uses could be permitted, such as grazing. The digging for earthen stock tanks, fencepoles, and building foundations would be precluded because of subsurface ordnance. Surface sweeping in areas of extremely dense ordnance (1-5 shells per square meter) may not be feasible since explosive charges are used to blow the ordnance up in situ. Prior to any surface construction or excavation, subsurface clearance of unexploded ordnance to a six-foot depth must be accomplished. A rough estimate of the cost per acre for such a clearance is $6,250.

(b) McGregor Range: At the present time, several thousand acres are being used for a 20-millimeter and 40-millimeter impact area on McGregor Range. This area is primarily the Hueco Mountains west-facing escarpment, and about 500 acres located in the desert basin portion of McGregor Range are used as an aerial gunnery range.

Post-military use of McGregor Range would require full compliance with 43 CFR 2374.2: In keeping with these provisions, the Department of the Army would not be discharged of its accountability and responsibility of these lands until:

—The lands have been cleared of explosive ordnance. If that is impossible, the Department of the Army would retain the responsibility for controlling access and managing the land until such time as new technology would permit removal of explosive ordnance.

—To the extent deemed necessary by BLM, the Department of the Army had undertaken appropriate land treatment measures correcting, arresting, or preventing deterioration of the land and resources which resulted from the Department of the Army's use or possession.

—The Department of the Army, with respect to improvements, has exhausted the General Service Administration's (GSA) procedures for their disposal and certifies that they are of no value.

—The Department of the Army has resolved through a final grant or denial, all commitments to third parties relative to the right and privileges in, and to, the lands and interest.

—The Department of the Army has submitted to the BLM a copy of, or the case file on, easements, leases, or other encumberances with which it has burdened the lands or interests therein.

(c) Other: In addition, much of the installation has been used as an impact area during the long history of the post. Although these areas are not designated specifically as impact areas, they may nevertheless present problems of decontamination.

5. Main Cantonment and Close-in Training Area: Land conflicts in these areas owe their origin to geophysical and geometric considerations. Fort Bliss lands lie astride the only East-West utility corridor in the area, due to the presence of Mexico to the south and the Sacramento and Organ Mountains to the north. As a consequence, oil, gas, and electric transmission lines traverse Fort Bliss lands. In addition, the City of El Paso has grown around the main cantonment area on the south, west, and northwest. This condition has resulted in land conflicts associated with transportation and utility easements.

C. Extent of Reconciliation.

1. Maneuver Area II: The Army has purchased all private land, and uses the public lands as the sole leasee. This has eliminated conflicts which existed as a result of using the area for both grazing and military use.

2. McGregor Range: A de-facto wilderness area now exists on the withdrawn National Forest lands which were included as part of the U.S. Forest Service's "roadless area." A continuation of the present installation policy allowing no new road construction in the de-facto wilderness area would ensure limited access to the area.

3. Dona Ana—Hueco—Orogrande Range Complex: Due to national defense training requirements, there is no reconciliation possible at this time.

4. Loop 375: Local highway officials have proposed a number of possible locations for the inclusion of a highway (Loop 375) through Fort Bliss to connect the Trans-Mountain Highway with the Border Highway, thus bypassing the congested areas of the City of El Paso. The Army has agreed in principle to the highway, and locational details are under discussion.

5. Cantonment and Close-in Training Areas: Owing to the complexity of issues involved, each land conflict must be addressed on respective merit. Accordingly, it cannot be stated at this time that all potential conflicts are amenable to solution or resolvement. Obviously, most can and will be resolved; yet it must be recognized that national defense interests will prevent Fort Bliss from agreeing to those projects that would result in unacceptable loss of training area.

6. Impact Areas: Present impact areas are an established fact. An installation policy that would attempt to utilize existing impact areas for future weapons and operations whenever possible might prevent additional areas from being subject to restricted land uses. However, there is no guarantee that new training would not require new impact areas.

III. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT.

A. Regional and National/International Environmental Effects.

Of the two largest air defense artillery centers in the world, Fort Bliss is the only facility presently available in the Free World. The installation's proximity to the country of Mexico results in a substantial economic and cultural impact upon Ciudad Juarez, Mexico.

B. Impacts of the Proposed Action.

Impacts of the proposed action have been quantified where possible, although in some cases (ecology, archaeology) insufficient baseline data is available or the data is such that quantitative interpretation is, at the time of writing, impossible. Programs will be undertaken by the Army to monitor the ecological effects and changes resulting from its mission, and research will be undertaken to determine means to mitigate impact of Army missions, particularly maneuvering; see Section III.C [Mitigation].

1. Impact Upon Socioeconomic Conditions.

The ongoing missions of this installation result in approximately $605 million injected into the local economy. The majority goes into the El Paso economy, but some helps support Ciudad Juarez, Mexico, and the small towns of Newman and Orogrande that border the installation. This tremendous positive impact upon the economy can be further emphasized by a "multiplier effect" model, developed by the Department of the Army's Construction Engineering Research Laboratory, Champaign, Illinois. In very general terms, for every dollar of input directly into the local economy, several more dollars of economic activity are stimulated.

The following is a list of areas within the local El Paso economy that are directly affected by the multiplier effect. (Data obtained from the Corps of Engineer's Research Lab Computer Program based on 1984 economic data).

RESULTANT BUSINESS VOLUME:	$777,702,000
INDUCED BUSINESS VOLUME:	$454,609,000
RESULTANT LOCAL PERSONAL INCOME:	$514,418,000
RESULTANT EXPENDITURES FOR HOUSING:	$ 92,595,000
RESULTANT NON-HOUSING EXPENDITURES:	$324,083,000
RESULTANT LOCAL PROPERTY VALUES:	$654,615,000
RESULTANT HOUSING INVESTMENT:	$ 43,057,000
RESULTANT NON-HOUSING INVESTMENT:	$ 38,890,000
RESULTANT TAX REVENUES:	$ 94,437,000
RESULTANT STATE AND FEDERAL AID TO SCHOOLS:	$ 3,845,000
RESULTANT COST TO SCHOOLS:	$ 2,456,000
RESULTANT OTHER LOCAL GOVERNMENT COSTS:	$ 24,340,000
CHANGE IN COST TO LOCAL GOVERNMENT:	$ 26,796,000

Another impact of the presence of Fort Bliss is the influx of military personnel and their dependents, many of whom return to find jobs or retire. This increases the rate of population growth. (No exact figure is available for the number of dependents associated with the estimated 14,195 retirees, but this number is estimated to be 28,300). Conversely, this increased population growth may be the most important indirect impact created, especially in an area of finite water supply and asymmetrical growth pattern imposed by mountains, by the borders of Mexico, and by Fort Bliss. A subjective and unquantifiable impact may occur upon the local indigenous Mexican-American culture, proportional to the influx of residents not of this native culture.

2. Impact on Air Quality. The quality of the air over the Fort Bliss ranges (U.S. Army Environmental Hygiene Agency, 1975) is good. However, air quality in the vicinity of Fort Bliss' main cantonment area is poor.

Fort Bliss is in a designated Prevention of Significant Deterioration (PSD) area with respect to sulfur dioxide (SO_2) and nitrous oxide (NO_X), while it is in a nonattainment area for particulates and oxidants. Fort Bliss' emissions for stationary sources is small compared to total emissions within the Air Quality Control Region (see Table 6). With regard to air emissions from mobile sources, it is reasonable to assume that most carbon monoxide, hydrocarbons, and oxides of nitrogen are emitted from the automobile (see Table 7). The Environmental Protection Office, DEH, conducted a vehicular emissions test on Fort Bliss on November 1983. A total of 473 vehicles were tested (1.2 percent of the approximate total vehicles on Fort Bliss) for hydrocarbons and carbon monoxide emissions. Results from this study were very much as expected A total of about 80 percent of the emissions from the vehicles tested were within the set U.S. Environmental Protection Agency's (USEPA) standards (see Table 5).

TABLE 5

VEHICLE EMISSIONS TEST (FAST IDLE)

PERCENT OF CARBON MONOXIDE	No. OF VEHICLES	PERCENTAGE	CUMULATIVE PERCENTAGE
.1-1	160	41.7	41.7
1.1-2	80	20.8	62.5
2.1-3	52	13.5	76.0
3.1-4	24	6.2	82.2
4.1-5	17	4.4	86.6
5.1-6	11	2.8	89.4
6.1-9.9	31	8.0	97.4
10+	8	2.6	100.0
	383	100.0	

U.S. Environmental Protection Agency maximum vehicle emission standard for carbon monoxide = 3.0%

Table 5 continues

HYDROCARBONS (ppm)	No. OF VEHICLES	PERCENTAGE	CUMULATIVE PERCENTAGE
1-100	224	47.7	47.7
101-200	129	27.4	75.1
201-300	48	10.2	85.3
301-400	23	4.9	90.2
401-500	8	1.7	91.9
501-600	5	1.0	92.9
601-1000	19	4.0	96.9
1001-1999	6	1.3	98.2
2000+	8	1.8	100
	470	100.0	

USEPA maximum vehicle emission for hydrocarbons = 300 ppm.

It is important to note that the USEPA has taken over enforcement of the State Implementation Plan (SIP) concerning measures and strategies to reduce air emissions from mobile sources, as required by the provisions of the Clean Air Act Amendments of 1977. At this time, therefore, the question of future compliance is a cloudy issue. Suffice it to say, however, that unless positive action is taken by the local and state governments, the El Paso Air Quality Control Region could have some rather severe sanctions placed upon it by the U.S. Environmental Protection Agency. Any such sanctions have the potential to impact Fort Bliss programs; to what degree remains to be seen.

In addition to above mentioned air emission categories, mobile and stationary, Fort Bliss' training activities produce the following:

(a) Weapons Firing: This activity occurs on the Meyer Small Arms Range, the Dona Ana Artillery Firing Ranges and McGregor Missile Firing Range. Emissions produced by this activity are photochemical oxidants, carbon monoxide, particulates, and oxides of sulfur and nitrogen. Particulates will also include substantial amounts of dust produced by firing concussion and impact of projectiles.

(b) Movement of Tracked and Wheeled Vehicles: Large quantities of dust result from movement of vehicles traversing desert terrain. In some areas the small particle size of the soil will cause the dust to remain suspended for considerable time and affect relatively large areas. Continuous and prolonged movement of vehicles will have a compounding effect and result in progressive increases of dust introduced into the atmosphere. Under some atmospheric conditions, dust from this activity on U.S. Highway 54, which parallels the western boundary at the reservation, would be especially affected by contaminants identified in this section.

TABLE 6

AIR POLLUTANT EMISSION, FORT BLISS

(tons/year)

Stationary Sources

POLLUTANT	FUEL COMBUSTION	INCINERATION	P.O.I. STORAGE	VEHICLES	TOTAL EMISSIONS TEXAS PORTION OF AQCR 153[1]
Particulates	8.2	2.9	—	38	11,300
SO_x	1.5	0.4	—	81	304,099
CO	34.2	3.6	—	3161	328,606
HC	12.4	2.2	506.9	324	51,779
NO_x	123.4	0.4	—	892	31,777

[1]Source: State of Texas, 1972. Implementation Plan for Attaining National Ambient Air Quality Standards.

TABLE 7

FORT BLISS AIR EMISSIONS FROM PRIVATELY-OWNED VEHICLES

(tons/year)

SOURCE	PARTICULATES	SULFUR OXIDES	NITROGEN OXIDE	HYDROCARBONS	CARBON MONOXIDE
*Estimated number of cars 38,390 and gasoline consumption per year 23.9 x 10^6 gals.	77.60	63.30	1,218.90	1,923.95	47,083.0

*See Appendix A for computations

(c) Training Operations Involving Tear Gas, Illumination and Smoke Munitions: Amounts of these pollutants should be relatively small and should not exceed 100—200 pounds per year. Moreover, they are used under strict control conditions. Tear gas produces eye irritation in concentrations of 1-5 mg/m^3, respiratory irritation of 12-20 mg/cu m, and is lethal to humans at 25,000 mg/min/cu m. Because tear gas breaks down to innocuous compounds at relatively rapid rates, intermittent usage should not significantly affect ambient air quality.

(d) Insect and Weed Control Program: Herbicides and insecticides are used on the main cantonment area, Biggs Army Airfield, and the McGregor and Dona Ana Range Camps. Herbicide application amounts to about eight tons per year while insecticide application is about 14,000 gallons per year. Herbicides include Atrazine, Dalapon, Monuron-TCA, Prometone, and 2, 4-D. Insecticides include Chlordane, Diazinon, and Malathion.

(e) Range Fires: Activities associated with the ongoing mission at Fort Bliss, particularly weapons firings, intermittently cause range fires which release large quantities of particulates (50-100 tons) into the atmosphere. In addition to affecting ambient air quality, range fires result in considerable expressions of concern from the private sector, in general, and environmental interests, in particular.

(f) Construction of Facilities: During the construction phase, equipment operation and other construction activities will produce air pollutants including dust. Mitigating measures, however, can be employed to control these pollutants within the prescribed standards.

3. Impact on Water Resources.

Water for Fort Bliss originates completely in the Hueco Bolson. The City of El Paso has three sources of water supply: the Rio Grande, wells in the Canutillo Area, and wells in the Hueco Bolson. In recent years, the annual average withdrawals for each of these sources has been as follows:

RIO GRANDE	20.7%
CANUTILLO	17.5%
HUECO BOLSON	61.8%

It is evident that the Bolson supply is the dominant source for the City at present. This is due to its low cost, good quality, and the ease with which it can be obtained and distributed, even during the peak summer season. Studies by the U.S. Geological Survey indicate that the Bolson has approximately 10 million acre-feet of fresh water storage, and another four million of slightly salty water available (Meyer, 1976).

Projections of demand for water in the El Paso Area are available from the Public Service Board. The forecast is for substantial increases in demand over time, in response to rapid population growth and some increase in per capita use. The specific projection which the Public Service Board has developed is as follows in the next page.

YEAR	POPULATION	AVERAGE PER CAPITA DEMAND, GAL/DAY	TOTAL AVERAGE DEMAND ACRE-FEET PER YEAR
1980-1989	513,676	210	120,832
1990-1999	613,316	218	149,766
2000-2009	757,445	225	190,900
2010-2019	901,575	230	232,275
2020-2029	1,081,889	223	282,365
2030-2039	1,262,204	235	332,254

If one assumes that nine million acre-feet of Bolson water are available to the City, plus the entire annual recharge amount of approximately 5,000 acre-feet per year; and that pumping over the next 60 years will average 150,000 acre-feet per annum; then the aquifer will be 97 percent exhausted in the year 2040 (Lee Wilson and Associates, 1978). An important caveat should be considered for this calculation: that is, it is crude and based on several simplifications. However, it illustrates the basic point that the low-cost water supply available to the El Paso Area from the Hueco Bolson is finite, and that within the foreseeable future, there will will be a significant need to obtain new water supplies to replace or supplement the Hueco Bolson.

It is important also to note that the full content of the fresh-water portion of the Bolson will not be available to the local water producers due to several problems; the most significant of which is salinity intrusion from saline layers. Continued withdrawal may cause salt water intrusion which will require a watch on the quality of water originating within the Hueco Bolson.

It is estimated that the operation of Fort Bliss supports a population of between 80,000 to 100,000 and, accordingly, Fort Bliss' impact on the local water supply might be as much as 25 percent.

4. Impact Associated with Noise. Analysis of the noise impact from the current military operations (outlined in Section I.C.I.(q) on the Fort Bliss Ranges clearly indicates that the large open land areas separating the noise sources from the population outside the installation boundaries serve as noise buffer zones. The results of this analysis serve as an explanation for the past history of no complaints concerning noise generated by activity on the ranges. The only potential problem areas that might arise are flight patterns directly over civilian communities and wildlife (see Section III.B.7. [Impact on Biotic Resources]) movement to and from range areas from the main cantonment area, and artillery firings at the Dona Ana artillery ranges.

Aircraft noise (including helicopter, fixed wing, and jet aircraft) impact can be minimized by having the aircraft maintain 2,000 feet minimum slant distance from the installation boundary.

Vehicle noise, for the most part, will be contained within the reservation. However, movement to and from the Dona Ana—Hueco—Orogrande and McGregor Range complexes, from the main cantonment area affects the ambient noise levels of the Northeast sector of El Paso. Due to the potential

impact from weapons firing on the ambient noise level of the civilian community of Chaparral Park, New Mexico (located approximately six miles from the southern most portion of the Dona Ana firing complex), actual field studies by USAEHA were conducted in August 1976. These studies conclusively indicated that there is no adverse noise impact on the civilian community. The USAEHA report which contains these studies is available from the Environmental Protection Office, Directorate of Engineering and Housing, Building 1160, Fort Bliss, Texas.

5. Impact on Solid Waste Disposal. Solid waste disposal includes domestic wastes and expended shell casings and metal remains of missiles and target drones. Sufficient land exists on Fort Bliss to meet all projected needs of sanitary land fill for domestic waste and expended shell casings are collected and recycled.

6. Impact on Utilities.

(a) Water: Evaluation of the Fort Bliss water utility systems indicates that water consumption by the installation averages approximately two billion gallons per year, with about one-third of this amount being purchased from the City of El Paso. Water supply for Fort Bliss and the surrounding communities is estimated to meet demands only for the next 60 years. Continued utilization of water by Fort Bliss will thus have an adverse impact on the finite water resources, and may reduce the water supply by 3-5 years.

(b) Electricity: Fort Bliss' total consumption is less than five percent of the total El Paso Electric Company's production in the El Paso area. This electrical demand places no adverse impact on the local environment.

(c) Heating: Annual consumption of natural gas by Fort Bliss is approximately one-tenth of the consumption by the local community. This natural gas demand is supplied to the military reservation by the Sothern Union Gas Company, and will have no adverse impact on the local community

(d) Sewage Treatment: Sewage from the main cantonment area of Fort Bliss is discharged into the City of El Paso's sewer system and ultimately treated at the Delta Street sewage treatment facilities. Because the central portion of El Paso (served by the Delta sewage plant) is fully developed, only minimal growth is forecasted for this area in the forseeable future. Upon completion of programmed expansion, capacity of the Delta sewage treatment should be sufficient to permit normal growth of Fort Bliss.

Fort Bliss range camps (Dona Ana, McGregor and Orogrande) have sewage treatment facilities which consist of Imhoff tanks connected in series with oxidation ponds to achieve secondary treatment. Because of the high net evaporation, about 100 inches per year, most of the water in these ponds goes only a short distance on the adjacent government land. Since this land is underlain at a shallow depth by caliche, which is essentially impervious to water, most of the overflow is rapidly evaporated. No adverse impact on the environment is created by the range camp sewage treatment facilities.

7. Impact on Biotic Resources. There are four primary activities which may produce adverse impact to subject resources, as follows: a) maneuvering of tracked and wheeled vehicles; b) concentrations of personnel and vehicles at bivouacs, supply areas, etc.; c) excavation of tank hull-down emplacements, gun emplacements, anti-tank ditches, etc.; and d) explosive ordnance and missile impact, which ignite range and forest fires.

(a) Maneuvering.

Maneuvering will be associated with the ongoing training mission of the 3rd Armored Cavalry Regiment (3D ACR), the air defense units, and large joint training exercises. The impacts vary in degree between these types of training, due to number of vehicles, duration and frequency of maneuvering, and types of vegetation and soils. The areas utilized on a repetitive basis are Maneuver Areas I through VIII (see Figure 3). Maneuver intensity associated with ongoing training can be estimated from the average number of track vehicle miles per year for the 3D ACR (this figure is an underestimate since it does not account for air defense and other unit training). Normal average miles per track vehicle is estimated at 850 per year; approximately 450 vehicles are involved, giving a cumulative yearly total of 382,500 track vehicle miles.

Approximately every fifth year, joint military service training exercises are held at Fort Bliss; these may involve up to 3,000 track and wheeled vehicles. Such exercises may last from five days to two weeks. Maneuver intensity can substantially increase during such training; examples of track vehicle miles are presented below for various possible scenarios. Examples "a" and "b" represent a typical number of vehicles involving the 3D ACR opposing an equal number of aggressor forces (900 track vehicles).

a) 900 vehicles X 50 miles/vehicle/day X 5 days = 225,000 miles = 59% yearly average

b) 900 vehicles X 150 miles/vehicle/day X 10 days = 1,350,000 miles = 350% yearly average

c) 1,800 vehicles X 50 miles/vehicle/day X 5 days = 450,000 miles = 118% yearly average

d) 1,800 vehicles X 150 miles/vehicle/day X 10 days = 2,700,000 miles = 700% yearly average

In preparing this statement, possible ultimate effects upon the environment have been estimated. Since there is no precedent to this type of maneuver activity in a desert habitat as a repetitive, cumulative process, the ultimate effects upon the soil and vegetation, and thus upon wildlife and the total ecology, cannot be quantified in the absence of a better data base; the extent of impact will depend in part upon type and number of tracked vehicles and frequency and distance of maneuver. It is not known to what degree impacts will be coincident. Impacts can be considered in terms of an ecosystem's "carrying capacity" for the subject land use. For example, dependent upon ecological conditions, a given ecosystem might support ten cattle per square mile (carrying capacity); exceeding this number of grazing animals might cause ecosystem deterioration or even irreversible soil and vegetation destruction. Similarly, a given ecosystem might support X number of tank miles per acre per year without adverse effect. We do not, however, know what the ecosystems' "carrying capacity" for maneuver vehicle miles per acre per year is, nor what impacts would be associated with level of this land use below and above this capacity. No doubt stress associated with drought years will reduce the capacity. Without more ecological impact data, impacts are conjectural.

Impacts are unknown due to: a lack of an established ecosystem base line which would serve as a basis for recognizing and monitoring impacts; and a lack of understanding of ecosystem component relationships sufficient to separate changes due to natural stresses (drought, etc.) from

changes due to military land uses. Impacts may be stated, but it should be noted that in the absence of the above, these statements are speculation and by no means reflect what may actually occur in intensity and degree of impacts.

In general terms, maneuvering will stress and disrupt ecosystems by altering soil properties, injuring/killing vegetation, reducing available vertebrate/invertebrate food resources and habitat, increasing erosion potential, and disrupting wildlife behavioral patterns. Impacts to soils will involve the churning of sands which results in reduction of cohesion and subsequent wind transport of soil particles. In mesquite dunal areas, soil between dunes is relatively shallow, and continual ablation of soil may result in a soil depth too shallow (over caliche) to support vegetation. Transported soil may bury and kill vegetation, thereby exposing the soil to further erosion. Playa soils are primarily loams or clay loams with smaller particle sizes. Vehicle travel will result primarily in compaction of these soils, reducing pore spaces, water permeability, and structure. Seedling germination and survival rates may be reduced, soil surface and subsurface temperature raised, and water holding capacity of the soil decreased. Pivotal turns of tracked vehicles can both cut into and displace soils to a depth of over a foot on both playa loams and dunal sands.

The present rate of maneuver related erosion is unknown. Fort Bliss has, however, begun a baseline erosion monitoring program to measure sand transport, erosion, and dune building. Sand trap data from this study suggest that along a one-kilometer-wide line of one meter deep, the following maximum amounts of sand are eroded/transported in tons per kilometer length per day:

GRASSLAND	0.07 tons/day
SMALL COPPICE DUNE AREA	0.65 tons/day
LARGE PARABOLIC COPPICE DUNE AREA	2.00 tons/day

Due to the limited scope of the study, the contribution of maneuvering to these transport rates was not investigated. Transport of particle sizes smaller than sand was not measured but probably is significant, given results of studies of dust storms in arid regions.

Observations on the installation to date suggest that sand transport is normally retarded or precluded by the formation of a cemented surface crust after rain, possibly due to cementation by calcium carbonate and/or other minerals present in the sand. Maneuvering destroys this crust, resulting in sand transport.

Vegetation, especially grasses and interdune plants, will be crushed outright, or may perish due to subsequent soil erosion from around roots. It is assumed that mesquite and other plants that occur on stabilized dunes will receive relatively less direct impact, since vehicles attempt to avoid the larger sand masses. Vehicles can and do cut through the sides of dunes, however; although, whether this will result in the weakening or death of the stabilizing mesquite and consequent dune movement is unknown. Playa and grassland vegetation and soils are probably significantly more fragile and subject to irreversible erosion/degradation than are the mesquite-stabilized sand dune areas, though this is speculation at present. Individual mesquite plants could be killed if vehicle tracks cut deep enough into the shallow interdunal soil to crush root systems. Loss of mesquite could result in

significant sand erosion and possibly dune field formation. Severe erosion down to or close to the caliche horizon would preclude revegetation. Exposure and compaction of B horizons will probably prevent germination or seedling establishment. This appears to be occuring at present.

There may be a resulting overall decrease in species diversity, with a few species (weed species) such as Russian thistle dominating the area and an accompanying reduction in overall productivity may occur. Depending upon soil type, continued maneuvering may compact soil and interfere with water permeability, in turn affecting plant growth. Dust raised from maneuvering, especially during temperature inversions common during the fall and winter, might coat plants, thereby reducing photosynthetic efficiency. Effect upon biomass, seed production and seedling survivability, if any, is unknown.

The mesquite stabilized coppice dunes provide the great majority of suitable burrow and cover habitat for rodents, snakes, box turtles, lizards, and the larger mammals such as coyotes, kit foxes, and badgers. The mesquite bushes provide nesting habitat for crissal thrasher, blackthroated sparrow, cactus wren, and Scott's oriole. Destruction of mesquite and crushing of dunes may have an effect upon wildlife. Rodents, rabbits, and lizards are probably not affected to any great degree. Larger mammals, box turtles, and nesting birds may be impacted if disturbed during their reproductive season. Noise may cause stress to certain groups of animals during maneuvers, although to what degree is not known. Low flying helicopters and aircraft have the potential for stressing big game animals, especially antelope. On a repetitive basis, health impairment or abortion could result.

(b) Concentrations of Troops and Vehicles

This activity will produce impacts similar to those discussed for maneuvering. The impacts will be localized to perhaps several hundred acres per year; the activity will be concentrated, and the impact, therefore, more intense. Possible worst case impacts would be complete trampling and killing of vegetation and severe soil compaction, especially in playa areas. Severe compaction would seriously impede water infiltration, seedling germination and survival, and reduce the water holding capacity of the soil. Playas and grasslands would probably be seriously impacted by such compaction, while mesquite dune lands would be affected to a lesser extent, especially where interdune vegetation is already absent.

(c) Excavations.

These will produce local impacts which will involve temporary disturbance of wildlife, destruction of vegetation and some wildlife habitat, and soil disturbance. Number of such excavations are unknown. A large JTX may require some 10-15 kilometers of anti-tank ditch. Relative impacts will probably not be very serious, given the large mass involved, although if playas and grasslands are involved, significant impact could result within these ecosystems due to the relatively small areas they encompass. Excavating may bring to the surface buried soils which are high in salt concentrations. Soils from several excavations were tested and averaged 23 mmhos/cm. Salt tolerant plants are those which generally tolerate 9 mmhos/cm. Few, if any, plants would survive 23 mmhos/cm. Revegetation of excavations and immediately adjacent areas may precluded due to high salt content. Eventual leaching of the salts by rain should permit plant reestablishment, however.

(d) Explosive Ordnance Impact.

There is potential for the ignition of fires in the McGregor Range grasslands, the grasslands on the alluvial slopes of the Organ Mountains, and in the wooded canyons of these mountains due to explosive ordnance and missile impact. Between January 1973 and June 1976, 135 fires were recorded on the installation; seven were of unknown origin, 24 were caused by lightning, and the remainder were due to ordnance/missile impact. However, area wise 16,327 acres were burned by lightning, 18,197 acres burned due to Army missions, and 3,840 burned due to unknown causes. The narrow canyons of the Organ Mountains contain mesic vegetative assemblages which are unusual for this portion of the Chihuahuan Desert. Douglas fir, white fir, and maple occur in canyons and provide arboreal habitat for a variety of wildlife. Fire could reduce or eliminate from this mountain range these species and the mesic habitat they provide. The military reservation abuts a BLM recreation area, Aguirre Springs Park, and a privately-owned park, La Cueva. Fires could spread and impact upon these adjacent areas if allowed to get out of control. Fort Bliss and BLM have cooperated and will continue to cooperate in fire suppression activities within this mountain range. Ordnance-caused fires are generally fought if and when they begin to move towards the Organ Mountains. The very real danger of unexploded ordnance to firefighters on the ground prevents response of this type in some areas; aircraft slurry drops are called in if the fires cannot be contained by hand. Recurring fires over the past 50 years in several lower canyons of the Organ Mountains have eliminated much woody vegetation, primarily juniper and oak.

Fires also occur within the grasslands of McGregor Range. These fires are fought and extinguished when detected. High winds combined with high fuel loads have, however, resulted in extensive areas burned before control is effected. Fort Bliss has begun to monitor the effects of fire within these ecosystems. Within the subject area, fires usually were the result of lightning strikes during the summer rainy season. As a result of military use of the area, there are now fires occurring during winter and spring seasons; current Fort Bliss monitoring efforts suggest that some plant species (e.g., black grama) may be adversely affected by fire occuring during those periods. More monitoring is required to evaluate long-term effects.

8. Impact on Historic Resources. The results of field survey on fort Bliss demonstrate 1) that a extensive and significant archaeological and historical record exist on the installation and, 2) military field training activities have had and continue to have an effect on that record, particularly the archaeological record. The sources of effect are various, and while not quantified, their ordering by relative degree of effect is as follows:

(a) Maneuvering by Tracked and Wheeled Vehicles: It results in substantial disturbance by crushing and churning which disrupts artifact distributions, house floors and walls, and disrupts stratigraphic associations.

(b) "Relic" Collecting by Troops and Civilians: In the long—term, relic collection produces an effect as great as, if not greater than, maneuver activity. The removal of artifacts from sites by collectors, produces residual quantitative and qualitative inaccuracies in the remaining data. The inaccuracies are very difficult to identify and to compensate for in analytical efforts, for the original characteristics of the data only can be estimated, not documented.

(c) Surface-to-Surface and Air-to-Surface Firing of Missiles and Artillery: The explosive impact of ordnance produces the same general effect as does maneuver activity. Some artifacts and small sites may be entirely destroyed by exploding projectiles. It is generally thought that the magnitude of such destruction is slight except in those areas where fire is concentrated over a long period of time; however, a more severe byproduct of such fire is the seeding or dudding of impact areas with unexploded ordnance, which can make

the areas too dangerous to conduct even surface survey work. Consequently, historic resources data contained in some areas cannot be obtained because it may be too dangerous to acquire, even through surface survey.

(d) Operation of Foot Troops: This can cause substantial effect when bivouac areas, defensive positions, and support activities are positioned on historic resources. Little effect would be expected when dispersed troops move quickly across historic resources during field training.

(e) Surface-to-Air Missile Firing: Field observations indicate that such training activity causes little effect. The debris of missiles exploding in the air is quite small and well dispersed. The small pieces of missile cause virtually no disturbance of the ground when they strike.

9. Impact on Aesthetics: This is a subjective and unquantifiable impact, complicated by the off-limits designation of the range.

One impact may conceivably be the act of preventing people from enjoying the aesthetics of the ranges, especially the treed, mountainous areas. Several military activities may affect the range aesthetics and are as follows: Maneuvering and construction of borrow pits and gun emplacements create scars. Dust raised as the result of maneuvering during fall and winter inversions could obscure the view of the mountains and give the impression of a polluted valley. The dust has been observed infrequently so far during these seasons, and is more evident along the Maneuver Area I - City of El Paso boundary. Litter consisting of troop rations, cans, and vehicle parts may result from Army exercises. It is standing operating procedure for Fort Bliss to police training areas in order to clear them of debris. Some areas of the range are de facto wilderness areas in that they are off-limits to all personnel and the public, and have no construction present. Portions of the Hueco Mountains, the Otero Mesa escarpment, and the Organ and Sacramento Mountains are included in this category.

10. Probable Impacts of Toxic Materials: The net impact on the environment from the application of pesticides is not known at this time; and the final determination must await the completion of ongoing studies and inventories. Subjectively, it can be stated that amount of toxic materials used at Fort Bliss is relatively small and should have no significant impact.

11. Impact of Explosive Ordnance: In the course of conducting military training that employs the use of explosive ordnance, an unquantifiable amount of unexploded ordnance results. Such action ultimately results in "seeding" affected areas to the extent that any land use of these areas other than current military uses must be contingent upon clearance or dedudding operations which may be prohibitively costly. A large portion of affected areas has been impacted in this manner. The ongoing mission at Fort Bliss also impacts on the soil, vegetative and wildlife resources due to the destructive nature of exploding ordnance.

12. Impact on Energy Resources: The range camps are currently supplied with the most efficient and inexpensive forms of energy available, and the usage of these energy sources does not place a significant demand or impact on the resources of the region. Energy sources of all types are used in insignificant amounts relative to usage in nearby urban areas. This energy is used in an environmentally safe manner, and hence, has no significant impact on the local environment. Areas of the installation have potential for oil, gas, and geothermal energy deposits. Although the military mission on the range has no effect on these reserves, the growing national demand and shortage of resources may make their exploitation desirable. If a geothermal reservoir underlies the range, the gradual loss of heat would be an impact of military use. Military use of the range keeps it from being used for solar energy production, although the region has sufficient open land to take advantage of this energy source.

13. Impact Upon Recreation and Land Use: As discussed in Section II, any impact area will contain unexploded ordnance. Land use restrictions are inherent. Land use will be severely restricted in impact areas. See Section II for discussion of unexploded ordnance impact land use conflicts.

Recreation activities, such as hiking, hunting, and rock hunting, are reduced by limited access because of training schedules and impact areas.

14. Impact on Soils and Geology: Impact upon the soils will occur primarily as a result of maneuvering, secondarily and only potentially as erosion resulting from vegetation loss due to fires.

Maneuvering, in particular, may result in soil destruction, including the destruction of A and B horizons, and the loss of organic material and nutrients. In loams and heavier soils, maneuvering will compact the soils if wet, reducing infiltration and enhancing run-off. Gulleys may form on slopes as a result; on dry soils of these general types, destruction of surface cohesion may result, subjecting silts to removal by winds. Sandy soils will similarly lose cohesion and sand grains will be subjected to wind erosion and dune formation. Ultimate wind erosion may result in elimination of soil above the calcic or petrocalcic horizons in interdune areas, particularly since basin sandy soils are relatively shallow over such horizons in interdune areas. The Otero Mesa and other BLM grazing areas and the Organ and Sacramento Mountains will not be affected by maneuvering impact. No data has yet been obtained as to what rate of erosion can be expected for a given type of maneuvering per year for each soil group. A study is currently underway to measure rates of wind erosion in maneuver areas (see Section III.C.1.(b)).

Deposits of gypsum, dolomite, sand, and gravel exist on portions of the range but cannot be utilized due to the military mission. There are sufficient quantities of these minerals available in surrounding areas and, therefore, no need to mine the deposits on the installation.

The commercial mining of these materials is not compatible with the military mission, but if the land is returned at some time in the future to public domain, the materials would become available. The base and precious metal potential for the range has not yet been determined and consequently projected impacts on this facet of the mineral sector cannot be quantified. A mineral survey would provide an indication of the metallic mineral values present.

15. Impact of Hazardous Waste: An analysis on the impact from Fort Bliss usage of hazardous waste clearly indicates that implementation of the installtion's Hazardous Waste Management Plan will greatly reduce the possibility of hazardous waste mismanagement. The impact from the generation of hazardous waste at Fort Bliss is insignificant.

16. Impacts on Endangered Species.

FEDERALLY LISTED

(a) Plants.

The area containing Coryphantha sneedii var. sneedii has been placed off-limits to military activities and is surveyed annually to monitor population status; no impact will occur to this species as a result of military activity. The U.S. Fish and Wildlife Service, Regional Office of Endangered Species, has been consulted in regards to this species and concurs in the no impact determination. The remaining candidate species — Rosa and Argemone — would occur in areas not currently affected by the military mission, and no impact is expected to occur to these species.

(b) Wildlife.

Fort Bliss has consulted with the U.S. Fish and Wildlife Service, Regional Office of Endangered Species, regarding potential impact to the wolf and to the peregrine falcon; it has been determined that no impact will occur to these species as a result of military missions (the wolf being considered extirpated from the area). It is recognized that peregrine falcon could nest undetected in the Organ Mountains sometime in the future. Low level flights of aircraft over suitable peregrine nesting habitat will be monitored and controlled if necessary. Spot surveys for peregrine will be undertaken from time to time in areas of most suitable nesting habitats. Peregrine prey base should not be affected by maneuver activities; virtually all such prey species utilize mountain areas rather than basin maneuver areas. Ordnance impact should not affect this species as ordnance does not impact into or near areas of suitable nesting habitat.

Fort Bliss has also consulted with the U.S. Fish and Wildlife Service regarding the black-footed ferret, and it has been determined that insufficient data exist at this time to suggest that this species is present on the installation. The Bureau of Land Management has located and taken a census of the prairie dog towns on and adjacent to the installation (see below). If all of Otero Mesa is included, there may be sufficient prairie dog populations to support ferret. If this ferret prey base is impacted, the ferret, if present, might be affected. Range fires could possibly affect the prairie dog (see below).

STATE LISTED (NEW MEXICO)

The Trans-Pecos rat snake and its habitat could be affected by range fires and maneuvering on the Organ Mountain alluvial fans (especially Boulder Canyon); the majority of its habitat, however, involves boulder flows and rocky areas that are not maneuvered upon.

The mottled rock rattlesnake could be killed if encountered in the field by troops, although most of its suspected range on Fort Bliss is impact area, and few, if any, troop activities will be permitted to occur in these areas.

The Sonora Mountain kingsnake could be affected by fire if such eliminated large areas of habitat.

The black-tailed prairie dog could be impacted by range fires. It is unknown at this time whether fire would cause harm to the habitat and food base of this species; the closely cropped vegetation within a dog town might not carry a fire. Dog towns are monitored by both Fort Bliss and BLM personnel; effects of a range fire will be closely monitored if one should occur on or adjacent to a dog town.

17. Impact of Additional Actions Since 1979.

This section summarizes impacts of those activities/missions that occurred/were assigned to the installation subsequent to the issuance of the draft statement in 1979.

(a) Construction and utilization of a Short Range Air Defense (SHORAD) Weapon Firing Range on McGregor Range: Construction will involve emplacement of targeting, facilities, and an access road. Use includes weapon firing of those weapons included in (d) below. This action resulted in the disturbance of approximately 75 acres of vegetation and soils within the alluvial fan-creosote zone on McGregor Range. An archaeological survey was performed and Range facility, targetry, and firing lanes were sited to avoid archaeological resources and a wildlife water source (Sulphur Tank). The impact area will be swept periodically for unexploded ordnance to preclude creation of a dud area and concommitant restriction of future land uses. An Environmental Impact Assessment (EIA) and a Finding of No Significant Impact on the Environment (FNSI) were issued in 1982 for this action.

(b) Construction and Utilization of a Multi-Purpose Range Complex in Boulder Canyon, Organ Mountains, Dona Ana Range #40: The purpose of the range is to train crews of the MI tank and Infantry and Cavalry fighting vehicles in live fire and maneuver tactics. Construction will involve maneuver and target access roads, target emplacement, and support facilities. This action will result in the disturbance of approximately 120 acres of vegetation and soils. An archaeological survey was performed and facilities, targetry, and maneuver and access roads will be sited to avoid archaeological resources. The design of roads and target berms will incorporate provisions for reducing erosion and enhancing vegetative recovery. The location of this range — Boulder Canyon — was already an existing range, Dona Ana #40. The type of range use will not change; intensity of maneuver use will increase. Impacts to soils and biotic resources probably will not increase, however; vehicles will be required to stay on designated roads rather than maneuver cross-country as is the case now prior to range construction, and range fires will be contained to some extent by newly graded maneuver roads which act as fire-breaks. An EIA and FNSI were issued for this action in 1982.

(c) Activation and Training of a Smoke-Generating Company: Training involves the production of "smoke" through atomization of oil droplets. A dense fog is produced and can cover an areas of up to eight kilometers in length and six kilometers deep. Some temporary disturbance of wildlife may occur during training. An EIA and a FNSI were issued for this action in 1981.

(d) Air Defense Program Modernization (PATRIOT, ROLAND, SGT YORK, and STINGER): Impacts of air defense training will not change in kind or degree as a result of system replacement of previous weaponry by the new generation of air defense weapons. Impacts discussed in the 1979 draft, and in Section II.B. of this document, are applicable.

(e) Special Forces Desert Training School Establishment: This involves the training of platoon-size units in specialty aspects of warfare in arid land scenarios. Training includes demolition, hit-and-run tactics, evasion, land navigation, and desert survival classes. Impacts associated with this action should be negligible and will be addressed in an EIA in the near future.

C. Mitigative Measures.

1. Soils and Geology.

(a) In the event McGregor Range is utilized for maneuvering, those areas of the alluvial fan - creosote bush zone and the foothills and draw-yucca grassland zone which are considered extremely susceptible to erosion will be placed off-limits to such activities, if compatible with the requirements of the military mission.

(b) As part of the Ecological Management Program (see below), the effects of Army missions on soil erosion will be monitored. Current monitoring involves measurement of sand movement and wind erosion on the maneuver areas. Results of such monitoring will aid in formulating means of reducing or eliminating erosion.

2. Biotic Resources.

(a) A comprehensive ongoing Ecological Management Program, based upon an ecosystem approach, has been instituted to quantify impacts occurring to biotic resources, to monitor these impacts, to determine appropriate mitigative measures, and to locate and protect endangered species. This program will continue for the duration of the impacting activities and will include ecosystem base line data gathering and update of same; quantification of maneuver damage by virtue of long-term monitoring of maneuver areas; endangered species survey and management; research into ecosystems response to fires; and any other investigations deemed necessary to determine impacts and appropriate mitigation associated with new and ongoing Army activities.

Projects recently implemented under this Program include the erosion investigation referenced above; an investigation of the effects of maneuvering upon vegetation and soils; and investigation into the effects of ordnance-caused fires upon the grassland ecosystems of McGregor Range.

(b) Rehabilitation and maintenance of the stockwater earthen tanks to reduce seepage losses. The extra water would allow a more even distribution of wildlife grazing on the range.

(c) Avoidance of buzzing or chasing of animals with helicopters. A minimum altitude or slant distance of 1,000 feet should preclude strong or startled reactions from the animals.

(d) Where compatible with requirements of the military mission, areas within the foothills and draw-yucca grassland zone which contain remnant grama grasslands, antelope habitat, and other prime wildlife cover and habitat will be placed off-limits to maneuvering if a decision is made to maneuver on McGregor Range.

(e) Utilize faculty and students of local universities and members of local nature societies to obtain ecological data.

3. Historic Resources.

It is acknowledged that the historic record on Fort Bliss is both sufficiently complex and threatened to require a comprehensive preservation plan. That plan has been developed, has been approved by the appropriate regulatory authories, is being implemented, and will be continued. Although it cannot be expected that the plan will eliminate effect to historic resources, those who have critically reviewed the plan evaluate it as an effective solution to the twin requirements of effective military training and effective protection of the historic record on Fort Bliss.

4. Air Quality.

(a) Application of herbicides and insecticides during dust storms and high wind conditions will be reduced or eliminated.

(b) Implement the Installation Air Pollutant Emergency Stand-By during air pollution episodes (as determined by the Texas Air Control Board).

(c) Continue to determine the cause and effect of air contaminants generated by the Fort Bliss mission.

5. Water Quality.

Fort Bliss has put into effect a water conservation program to reduce the consumption of water. In addition, Fort Bliss has developed a policy which encourages that all new construction will be landscaped with native vegetation, thus reducing the requirements to water additional grassed areas.

Several years ago, the City of El Paso adopted a conservation program by constructing some of their new water wells in the Hueco Bolson Aquifer in a manner to blend fresh ground water with slightly saline ground water produced from sands underlying the fresh water sands. This blending was intended to help reduce the depletion effects of ground water mining and to effectively use the lightly saline ground water reserves in the Hueco Bolson Aquifer.

6. Noise Quality.

(a) Aircraft will maintain a 2,000 foot minimum slant distance within the city limits of El Paso.

(b) A slant range or altitude distance of 1,000 feet or more, and the avoidance of direct overflight of antelope herds will be maintained.

7. Solid Waste Disposal.

There will be increased command emphasis on standing operating procedures for the proper disposal of domestic waste generated by troops which make use of close-in training areas, ranges, and maneuver areas.

8. Toxic Materials.

Toxic materials (insecticides, herbicides, petroleum products, and battery acids) are used in very small quantities and in an environmentally safe manner. Mitigating measures for this slight impact will include reducing the use of toxic materials during temperature inversions and high wind-dust conditions.

9. Energy Resources. There are no known mitigating measures for Fort Bliss' impact on energy resources, other than good conservation practices.

10. Hazardous Waste.

Hazardous waste, once generated, will be handled, stored, and disposed of in accordance with the applicable federal and state regulations. Mitigating measures for this slight impact will be to continue implementing the applicable regulations summarized in Fort Bliss' Hazardous Waste Management Plan.

IV. ALTERNATIVES TO THE PROPOSED ACTION.

Alternatives that Might Enhance Environmental Quality

A. Locating a Range for Missile Firing and Surface Maneuvers Elsewhere.

This alternative would require the withdrawal or acquisition of another land area of approximately the same size and characteristics as currently being used by Fort Bliss.

1. Impacts on the Human and Natural Environment.

Before relocation could take place, live fire ranges on Fort Bliss would have to be decontaminated. If relocation of Fort Bliss' operations were elected, the long-term consequences would result in improvement of the ecological conditions, including soils, grazing capacity of the range, and the elimination of solid waste (missile debris). Air, water, and noise quality, which are not heavily impacted, would not significantly improve if Army activities were to be discontinued. Current impacts on vegetation, wildlife habitat, and soil erosion would no longer occur. Portions of McGregor Range have excellent potential for hiking, camping, backpacking, sightseeing if the Army were not using the area. Other areas of McGregor Range would continue to be extremely dangerous to the public because of the almost impossibility of decontamination. Note however, that the impacts now resulting from military activities on Fort Bliss would occur at another location, resulting in little if any reduction in overall environmental impact.

Lengthy planning and careful scheduling by the Department of the Army would be required to find and acquire a range with the capabilities of the Fort Bliss' guided missile training and testing center. The expense of relocation and the resultant disruption of training schedules does not seem to be cost-effective in the long-term given that environmental impact like those now being experienced on Fort Bliss would occur at another location.

2. Impacts on the Economy.

In the short-term, closure of the installation would have a significant impact on the regional economy. The regional economy would lose the input of about $605 million annually and an additional several billion dollars resulting from the multiplier effect. (see page III-1).

In the long-term, the closure of this installation may not result in such an adverse economic impact and may even result in a beneficial one. The abondoned facilities and land at Fort Bliss could be acquired for both public and private uses. These uses would yield a greater tax base for the region and invariably create greater economic activity than the present military use now allows. This could offset some, if not all, of the initial adverse impacts of closure on the regional economy.

B. Using White Sands Missile Range for the Activities on Fort Bliss.

This alternative concerns the use of White Sands Missile Range (WSMR) for the tactical live firing and maneuvering that is presently conducted on Fort Bliss.

1. Impacts on the Human and Natural Environment.

Relocation from Fort Bliss to WSMR would remove the impacts of military use from the range and open them up for limited public uses and an expanded grazing program. The military impacts on vegetation, soils, wildlife, and historic resources on the installation would no longer occur. Certain portions of the ranges would be opened to the public for recreational uses where portions of these could be certified and free of duds. The alternative would transfer the impacts which occur from missile firing and maneuvering on the installation and would impose them on the White Sands Missile ranges.

2. Impacts on the Mission of Fort Bliss.

White Sands Missile Range was established for the research and development (R&D) of missile and other systems for the U.S. military arsenal. It was never intended as a facility for tactical unit firing practice or other training missions. Currently, WSMR has an extensive annual firing schedule for its mission, and the addition of tactical firing would always take a low priority to the R&D mission. Scheduling of realistic tactical firing would be virtually impossible. Over 300 missiles are fired at McGregor Range annually, and to add this schedule to that of WSMR would not be feasible.

C. Continuing Military Training on Fort Bliss.

This alterantive would continue current levels of military training conducted on Fort Bliss. Each proposed future change in military activity would be subject to the environmental assessment and/or statement process as currently required.

1. Impacts on the Human and Natural Environment.

There would be no change in the present situation. The current study and mitigation programs designed to identify and reduce impacts would be continued.

2. Impacts on the Mission of Fort Bliss.

There would be no impact on the mission of Fort Bliss under this alternative.

V. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

Adverse and Unavoidable Impacts

A. Socioeconomic.

Varying rates of increase in the population growth of El Paso will result from Fort Bliss' continued operation, with concommitant variable demands upon services, space, water, and other resources.

B. Air Quality.

Maneuvering, especially large scale field exercises, will result in vehicular fuel pollutants and large amounts of particulates being discharged into the atmosphere. Also, air pollutant emissions of static sources as discussed in Section III.B. [Impacts of Proposed Action] and III.B.2. [Impact on Air Quality] are unavoidable impacts associated with the operation of Fort Bliss.

C. Water Quality.

The one area of unavoidable impact associated with water resources will be Fort Bliss' contribution to the depletion rate of the finite water supply of the El Paso area.

D. Noise.

Noise impact associated with vehicular movement to the New Mexico ranges will impact portions of Northeast El Paso. Aircraft noise may also have adverse impact on areas adjacent to the reservation and upon wildlife.

E. Utilities.

The chief area of impact is water resource depletion addressed in paragraph C [Water Quality], above.

F. Biotic Resources.

Adverse effects upon ecosystems and their components will occur due to maneuvering. Possible temporary or permanent habitat destruction and concommitant wildlife population decrease may occur due to grassland fires on McGregor Range and in the Organ Mountains.

G. Historic Resources.

Unavoidable adverse impacts on the archaeological resources will occur as a result of field maneuver activities. However, continued support of Fort Bliss' Historic Preservation Plan should reduce those impacts to an acceptably low level.

H. Hazardous Waste.

There are two unavoidable impacts associated with hazardous waste management: 1) the continual potential for contaminating spills and 2) the constant evaporation of chemicals when used, which contributes to the hydrocarbon count in the El Paso air basin.

I. Aesthetics.

An unquantifiable impact will result due to the off-limits (to the general public) designation of some scenic areas of the installation.

J. Explosive Ordnance.

In the course of conducting military training that employs the use of explosive ordnance, an unquantifiable amount of unexploded ordnance will result. Such action ultimately results in "seeding" affected areas to the extent that any land use of these areas other than current military uses must be contingent upon clearance or dedudding operations. Within the framework of current technology, clearance and dedudding operations may be prohibitively costly. A large portion of affected areas has been impacted in this manner. This action will impact on the soil, vegetative, and wildlife resources because of the destructive nature of exploding ordnance.

K. Energy.

Army land use needs may prevent use of geothermal reservoirs under the installation. Retrieval of any petroleum deposits also may be impossible during Army use of the land.

L. Recreation and Land Use.

The off-limits designation of most of the installation will prevent recreational pursuits by the general public. Future land uses will be restricted due to the presence of unexploded ordnance, as stated above in V.1.

M. Soils and Geology.

There is potential for severe soil erosion due to maneuvering. If precious minerals, etc., exist on the installation, retrieval of these deposits may be impossible during the Army use of the land.

VI. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

A. Trade Off Between Short-term Environmental Gains at the Expenses of Long-term Losses.

There are no known short-term environmental gains being achieved at the expense of long-term environmental or military losses. Fort Bliss' environmental programs have been designed to be integrated with the military mission to attain long-term goals related to environmental protection and military training needs.

B. Trade Off Between Long-term Environmental Gains at Expenses of Short-term Losses.

1. Conceivably, the off-limits policy applicable to the impact areas will create and preserve de-facto wilderness areas in the Organ and Hueco Mountains portions of the installation. Essentially, these areas represent key habitat for several uncommon or protected species, such as the peregrine falcon, the golden eagle, the kit fox, etc. These areas also represent points of dispersion for these species.

2. The Historic Preservation Plan represents a middle position between preservation of all or none of the archaeological sites on the installation; it is a plan being implemented in the context of ongoing military training. In the short-term, archaeological sites are being damaged by military training; however, in the long-term, the plan will result in significant improvement in the knowledge, understanding, and protection of the archaeological record. The management policies and procedures being developed and tested at Fort Bliss also should result in substantially better long-term protection of the archaeological record than would be possible in the absence of training activities that result in short-term losses.

C. Extent to Which Proposed Action Forecloses Future Options

The impact areas seeded with unexploded ordnance will greatly restrict future land use options for the next generation.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES.

A. Socioeconomic.

Fort Bliss will continue to be a major economic asset to the region and to the City of El Paso. Resultant contributions to continued economic growth probably will result in a concommitant increase in land use and development and depletion of the region's finite water source.

B. Biotic Resources.

There will be an as yet unquantified and possibly irreversible impact upon basin vegetation due to maneuvering and upon Mesa grassland and Organ Mountain arboreal vegetation and wildlife habitat resulting from ordnance-caused fire. Worst case modification of vegetation and/or severe erosion could completely and irretrievably change vegetational associations and wildlife habitat and thus irreversibly alter ecosystems.

C. Historic Resources.

Degree of irretrievable loss will be directly proportional to the level of funding support for the Historic Preservation Plan. Even if the plan is well supported, some damage will probably occur due to human error, especially during night maneuvers and divisional size exercises which utilize personnel unfamiliar with local maps and terrain.

D. Recreation and Land Use.

Portions of the installation have historically been used for artillery firing, and the projectiles which remain are a potential hazard for an unknown period. Records do not indicate the number or location of all projectiles which may represent unexploded ordnance. Irreversible and irretrievable commitments of land use may result, especially if clearance (dedudding) operations prove prohibitively expensive.

E. Soils and Geology.

Irreversible soil erosion may occur due to maneuvering or denudation of vegetation by ordnance caused fires, particularly on slopes, in the dunes and interdunal soils, and in grasslands located on sandy soils.

F. Energy Resources.

It is estimated that approximately 12 million gallons of gasoline and other fuels are required per year to support this installation's mission.

G. Water.

Although water in some areas can be a renewable resource, such is not the case for Fort Bliss and the El Paso area. Water is a finite resource because the recharge rate of underground water sources is exceeded by the pumpage rate. As a result, a point will be reached at which time water will cease to be available from this present source. This point could be reached within 50 years from now.

VIII. NATIONAL DEFENSE CONSIDERATIONS THAT MUST BE BALANCED AGAINST THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

To insure the stability of the socio-political and economic systems that are prevalent in this nation, it is paramount that a strong National Defense force be maintained. To maintain a strong force, it is necessary to continually train and develop capable units which can be deployed anywhere in the world. This includes the air defense and armored strike units, some of which are based and/or conduct their training at Fort Bliss.

IX. COORDINATION COMMENT AND RESPONSE.

A. General

The National Environmental Policy Act of 1969 requires that the expertise and views of a broad of knowledgeable people be used in preparing environmental statements. This section contains a history of the coordination effort and the written correspondence of those who have provided input to the draft environmental statement.

B. Summary of Coordination.

The draft statement was transmitted to the Council on Environmental Quality in July 1979 and circulated to various Federal, state, and local agencies, conservation associations, and individuals. Notice of Availability was published in the *Federal Register* of July 20, 1979. The comments received have been reviewed and evaluated, and where applicable, revisions were incorporated in the final statement.

C. Listing of Responses Received.

Texas Archaeological Society, Dallas, Texas
West Texas Council of Governments, El Paso, Texas
New Mexico State Planning Division, Santa Fe, New Mexico
Texas Office of the Governor, Austin, Texas
Texas Department of Water Resources, Austin, Texas
U.S. Department of Labor, Washington, D.C.
U.S. Soil Conservation Service, Temple, Texas
U.S. Department of Housing and Urban Development, Dallas, Texas
U.S. Department of Health, Education, and Welfare, Atlanta, Georgia
U.S. Environmental Protection Agency, Dallas, Texas
U.S. Department of the Interior, Albuquerque, New Mexico
U.S. Advisory Council on Historic Preservation, Washington, D.C.
U.S. Department of Agriculture, Soil Conservation Service, Temple, TX.

These letters with numbered responses are presented in the pages following the Comments and Responses Section.

D. Comments and Responses.

COMMENT NUMBER	RESPONSE
1	Agree that the Hot Wells site is not discussed specifically. However, this site is one of 29 archaeological site/district areas off-limits to military activities. Refer to pg. I-37.
2	Agree. The Final EIS has been revised to incorporate data obtained from the City of El Paso. Refer to page I-8.

COMMENT NUMBER	RESPONSE
3	Noted.
4	The Final EIS has been revised to incorporate this information. Refer to pages I-19 and I-21.
5	The Final EIS has been revised to incorporate this information. Refer to pages III-6, III-7, and III-18.
6	Section I.C.1. has been revised to incorporate this information. Refer to page I-19.
7	Agree. The Final EIS has been revised to incorporate this information. Refer to page IV-1.
8	Agree. The Final EIS has been revised to incorporate this information. Refer page I-20.
9	Agree. The Final EIS has been revised to incorporate this information. Refer to page I-21.
10	Fort Bliss does not dispose of oil tank sludge nor hazardous waste on lands in the installation for such action would be a violation of the Ft. Bliss Hazardous Waste Management Plan. Infectious waste from WBAMC is being disposed of in Fort Bliss' Sanitary Landfill, under specific guidance provided by the Texas Health Department.
11	Noted.
12	Noted. A Memorandum of Agreement subsequently was developed pursuant to 36 CFR 800.6. The Historic Preservation Plan discussed on Page I-37 was developed and is being implemented in response to the Agreement.
13	Fort Bliss is not aware of any important aquifer recharge area within the installation.

COMMENT NUMBER	RESPONSE
14	Impacts to flora and fauna from chemical agents utilized during training (primarily CS powder and gas and fog oil) have not been identified. Studies to date by the Army suggest that these agents may produce minor and short-term irritation in high concentrations. Studies referenced in Section III.C.2.a. may provide more conclusive data at some future date.
15	These revisions have been incorporated into the Final EIS in Section II.B.
16	The Final EIS has been revised to incorporate this information. Refer to page II-4.
17	Concur. The Final EIS has been revised to reflect consultation initiated in 1980 for the referenced species. The discussion of endangered plants has been revised to incorporate new presence/absence data and amend listing status, where appropriate.
18	The Ecological Management Program has been implemented. Continuation of the Program and requisite monitoring and management studies are contingent upon funding availability.
19	There are approximately 88 permanent water troughs which provide a permanent water source each 2-3 miles, plus 67 earthen cattle tanks (in varying stages of water trapping efficiency) trapping seasonal (summer) rains located on the Bureau of Land Management grazing units on McGregor Range. Adjacent to the Bureau of Land Management grazing units on McGregor Range, there are approximately 160 earthen cattle tanks and 9 small dugouts which provide some seasonal water. Some of these earthen tanks (5-30 percent of the total) require rehabilitation to ensure retention of water. There is a five-year plan which has been implemented to rehabilitate these tanks, pending availability of funding. Refer to Section III.C.2.(b) of the Final EIS. It is felt that wildlife water resource availability for the approximately 700,000 acres of McGregor Range is adequate.

COMMENT NUMBER	RESPONSE
19 (continued)	There is a lack of surface water resources on the maneuver areas. However, these areas have not historically supported antelope, nor do they now support mule deer. While it is recognized that surface water is important to wildlife, such water systems would be of benefit to a very low density of wildlife, and would be of little mitigating value as regards maneuver impact.
20	A Memorandum of Agreement pursuant to 36 CFR 800.6 was developed and signed in 1981. An Historic Preservation Plan subsequently was developed and signed by the Council in 1982. This plan represents Fort Bliss' long-term, programmatic compliance with Section 106. See page I-37.
21	Review of the Draft EIS by the Soil Conservation Service is acknowledged.
22	Review of the Draft EIS by the Fort Worth Regional Office of the Department of Housing and Urban Development is acknowledged.

APPENDIX A

Calculation for Air Emissions from Privately-Owned Vehicles

Present strength of the post:

1. Military personnel		19,829
2. Civilian personnel		7,790
	TOTAL	27,619
Total married persons		17,952
about 65% married		9,667
Number of cars for married persons about 1.6 per/family		28,723
Number of cars for unmarried persons about 1 per/person		9,667
		38,390

Average gasoline consumption/year

$$= \frac{38{,}390 \text{ X } 9{,}780 \text{ mi/yr/car}}{15.7 \text{ mpg}}$$

$$= 23.9 \text{ X } 10^6 \text{ gallon/year}$$

Pollutant: The parameters are calculated on the basis of emission factors given by U.S. Environmental Protection Agency, Office of Air Quality Planning and Standard, Research Triangle Park, North Carolina 27711 - March 1975.

$$\text{Lube Oil} = \frac{38{,}390}{9.3 \text{ gal/car/year}} = 4.128 \text{ X } 10^3 \text{ gallons lube oil/year}$$

1. Particulate

$$= \frac{6.50 \text{ lbs/1000 gallons X } 23.9 \text{ X } 10^6 \text{ X gal/year}}{1000}$$

$$= 155{,}350 \text{ lbs/yr}$$

$$= 77.6 \text{ tons/year}$$

2. SO_x

$$= \frac{5.30 \text{ lbs/1000 gallons X } 23.9 \text{ X } 10^6 \text{ gal/year}}{1000}$$

$$= 126{,}670 \text{ lbs/year}$$

$$= 63.3 \text{ tons/year}$$

3. NO_x

$$= \frac{102 \text{ lbs/1000 gallons} \times 23.9 \times 10^6 \text{ gal/year}}{1000}$$

$$= 2{,}437{,}800 \text{ lbs/year}$$

$$= 1{,}218.9 \text{ tons/year}$$

4. HC

$$= \frac{161 \text{ lbs/1000 gallons} \times 23.9 \times 10^6 \text{ gal/year}}{1000}$$

$$= 3{,}847{,}900 \text{ lbs/year}$$

$$= 1{,}923.95 \text{ tons/year}$$

5. CO

$$= \frac{3940 \text{ lbs/1000 gallons} \times 23.9 \times 10^6 \text{ gal/year}}{1000}$$

$$= 94{,}166{,}000 \text{ lbs/year}$$

$$= 47{,}083.0 \text{ tons/year}$$

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west texas council of governments
THE MILLS BUILDING, SUITE 700 • 303 N. OREGON STREET • EL PASO, TEXAS 79901 • (915) 532-2910

October 11, 1979

Commander
U.S. Army Air Defense Center
and Fort Bliss
Directorate of Facilities Engineering
Attn: ATZC-FEE
Fort Bliss, TX 79916

Re: Draft Environmental Statement of
Ongoing Mission, Fort Bliss, Texas

Dear Sir:

In accordance with OMB Circular A-95 and the National Environmental Policy Act of 1969, the West Texas Council of Governments has reviewed the above captioned Environmental Assessment for activities on the Fort Bliss Military Reservation.

Although generally in agreement with the findings outlined, the WTCOG notes that population projections utilized are not in agreement with current estimates and projections of the City of El Paso. It is recommended that you contact the City of El Paso, Department of Planning and Research, to resolve any apparent conflicting data. 2

We appreciate the opportunity to review this report and would like to be kept abreast of any changes or revisions prior to final dissemination.

Thank you for your cooperation and if we can be of any further assistance, please do not hesitate to contact us.

Sincerely,

Justin R. Ormsby
Deputy Executive Director

JRO/cf

cc: City of El Paso, Department of Planning

PLANNING DIVISION
(STATE CLEARINGHOUSE)

MIS 6

REVIEW CERTIFICATION FORM

STATE PLANNING DIVISION
DEPT. OF FINANCE AND ADMINISTRATION
505 DON GASPAR
SANTA FE, NEW MEXICO 87503
(505) 827-2073

TO: Department of the Army DATE: September 26, 1979

SUBJECT: _____PRELIMINARY REVIEW

_____FINAL REVIEW

_____STATE/AREA PLAN

__X__ D E.I.S.

PROJECT TITLE: DEIS of Ongoing Mission, Fort Bliss, Texas

APPLICANT: Department of the Army

FEDERAL CATALOG NO: 12.000

FEDERAL AGENCY: Department of Defense

SAI NUMBER: 80 07 11 079

PROPOSED FUNDING (PER 424 FORM)

	AMOUNT
FEDERAL	$ _____
APPLICANT	_____
STATE	_____
LOCAL	_____
OTHER	_____
TOTAL	_____

FOR FINAL APPLICATION ONLY:

REVIEW RESULTS:

__X__ The application is supported.
__X__ The application is not in conflict with State Areawide or Local plans.
_____ Comments are attached for submission with this application.

3

You may now submit your application package, this form and all review comments to the Federal or State Agency(s) from whom action is being requested.

Please notify the Planning Division (Clearinghouse) of any changes in this project. Refer to the SAI number on ALL correspondence pertaining to this project.

R Rodriguez
TECHNICAL ASSISTANCE
AND RESEARCH

Approved July, 1978
Secretary, DFA

JLS Anita Hesenberg
PLANNING DIVISION

2 - white
1 - to applicant
1 - for Federal Agency
1 - yellow - SPD copy

TEXAS ARCHEOLOGICAL SOCIETY
SOUTHERN METHODIST UNIVERSITY
BOX 161
DALLAS, TEXAS 75275

30 Sept 1979
El Paso, Texas.

Commander
U.S. Army Air Defence Center and Ft Bliss
Directorate of Facilities Engineering
attn: ATZC-FEE
Ft. Bliss, Texas 79916

Dear Sirs,

This letter is in reference to:
"Draft Environmental Impact Statement of Ongoing Mission, Fort Bliss, Texas."

My comment on the subject draft is the same as my comment on the Draft Environmental Impact Statement on the Acquisition of Maneuver Area II, (copy enclosed). 1

The subject draft does not refer to the Historic Property of Hot Well Archeological Site. This Site was entered on the National Registry of Historic places as of 30 april 1976.

Sincerely Yours
Lee Davis
President
9801 Gochwind
El Paso, Texas 79924

94-334-B5,M1
DEH

TEXAS ARCHEOLOGICAL SOCIETY
SOUTHERN METHODIST UNIVERSITY
BOX 161
DALLAS, TEXAS 75275

27 December 1978

Headquarters
Department of the Army
Attn: DAMO - TRS
Washington, D.C.

Dear Sirs:

This letter is in response to a request for comments on

DRAFT ENVIRONMENTAL IMPACT STATEMENT
ACQUISITION OF MANEUVER AREA 11
UNITED STATES ARMY AIR DEFENSE CENTER
AND FORT BLISS
15 SEPTEMBER 1978

Please be advised that the Hot Well Archeological Site is located in the proposed Maneuver Area 11. This site is situated in the north-east sections marked H W and T P of the map on page 14 of the Draft Statement. The Hot Well Archeological Site is listed on the National Register of Historic Places as of 30 April 1976, and published in the Annual Listing of Historic Properties, P. 5309, the Federal Register, Tuesday, February 7, 1978.

The protection of this scientifically and historically valuable property should be discussed in the environmental impact statement.

Sincerely yours

Les Davis, President
9801 Gschwind
El Paso, Texas 79924

MIS 4

PLANNING DIVISION
(STATE CLEARINGHOUSE)
PROJECT NOTIFICATION AND REVIEW SYSTEM

Review of:
S.A.I. No. 80 07 11 079

GENERAL REVIEW AND COMMENT FORM

TO: Review Agency Kate Wickes, Planning Bureau

Agency Address _____ City _____ Zip _____

FROM: Planning Division, Department of Finance and Administration

Address 505 Don Gaspar Avenue City Santa Fe, NM Zip 87503

SUBJECT: (Project Title) DEIS of Ongoing Mission, Fort Bliss, Texas

Because of your possible interest in this project it has been submitted to you for review and comment. Please complete this form and return to Planning Division, Dept. of Finance and Administration by September 21, 197 (date)

(To be Completed by the Reviewer)

1. Are you aware of any programs which have similar goals and objectives to the proposed plan? Yes_____ No X
   If yes, who provides these programs? What populations are being served?

2. In your estimation, do these programs preclude the need for the proposed program? Yes_____ No X

3. Is the proposed plan incompatible with existing or planned programs you are aware of? Yes_____ No X If the answer is yes, in what way is the proposed program incompatible?

4. Does the proposed program conform with a comprehensive plan developed for the area in which it is located?
   Yes — No —

5. In your opinion, is the population being served in critical need of, or large enough to warrant, the proposed action?
   Yes_____ No — If no, explain.

6. Does the proposed plan conflict with any applicable statute, order, rule or regulation (federal, state, local) with which you are familiar? Yes_____ No X If yes, cite the conflicting statute, order, rule or regulation.

7. Describe any suggestions on means of improving or strengthening the proposed program.

8. Is the information contained in the application and information forms consistent?
   Yes

9. On the basis of the above evaluation, convey your general conclusion by checking the appropriate statement or statements:
   - X No interest in or comment on this project
   - _____ Proposal is supported
   - _____ Proposal is considered nonessential, as explained below
   - _____ Additional information is desired, as described below
   - _____ Conference desired with applicant

10. Remarks or additional comments.

SIGNATURE OF REVIEWER Kate Wickes
TITLE Planner IV
DATE September 22, 1979

Approved July, 1978
Secretary, DFA

1 - white - to applicant
1 - yellow - SPD copy
1 - pink - Review Div. copy

OFFICE OF THE GOVERNOR

WILLIAM P. CLEMENTS, JR.
GOVERNOR

September 7, 1979

Mr. Bruce A. Hildebrand
OASA (IL & FM)
Washington, D. C. 20310

Dear Mr. Hildebrand:

The Draft Environmental Impact Statement for the ongoing missions at Ft. Bliss, Texas prepared by the Department of the Army has been reviewed by the Budget and Planning Office and interested State agencies. Copies of the review comments are enclosed for your information and use.

The Budget and Planning Office appreciates the opportunity to review this document. If we can be of further assistance in this matter, please do not hesitate to call on us.

Sincerely,

Donald E. Harley

Donald E. Harley, Manager
Economic and Natural Resources
Budget and Planning Office

DEH:jl

Enclosure: Comments by -
Texas Department of Water Resources

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

Harvey Davis
Executive Director

August 20, 1979

Dr. Paul T. Wrotenbery, Director
Budget & Planning Office
Executive Office Bldg.
411 West 13th Street
Austin, Texas 78701

Re: Department of the Army, Training and Doctrine Command--Draft Environmental Impact Statement (DEIS) -- "Ongoing Mission, United States Army Air Defense Command and Fort Bliss, Texas." March 1979. (DEIS-9-07-017.)

Dear Dr. Wrotenbery:

In response to your July 23 memorandum, the Texas Department of Water Resources (TDWR) has reviewed the referenced DEIS prepared by the Department of the Army pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969, assessing the environmental impacts associated with the ongoing mission and related support facilities and services at Fort Bliss, Texas.

TDWR offers the following staff review comments:

1. Pages I-18, -19; III-3, -6, -7; V-1; & VII-1.

Attention is invited to the underlined portions of the following vital summary statement on page I-19 (second paragraph):

> "To protect this ground water resource within the Hueco Bolson and to ensure an adequate water supply for further development, the City of El Paso is formulating plans which call for a comprehensive water supply program; one that will not rely solely upon the Hueco Bolson but will also look to importation, to recycling and to the increase of river (i.e., Rio Grande) water as a means of achieving an adequate reliable water supply." (Underlining, and parenthesized words were added for emphasis.)

In extension of the foregoing statement and related statements made on pages I-18, -19; III-3, -6, -7; V-1; and VII-1, relative to the City of El Paso's water requirements and activities pertaining to

water resources planning, development, and management, -- TDWR offers the following additional or updated information for consideration in finalizing the DEIS:

a. Recycling of Wastewater: On July 17, 1979, TDWR approved the City of El Paso's plan to build the proposed federally-assisted, 10-mgd capacity Northeast Sewage Treatment Plan (STP), which will include a pilot feasibility sub-project providing for the artificial recharging by well-injection method, the freshwater portions of the Hueco Bolson Aquifer in the El Paso area using 8 mgd of Northeast STP's 10 mgd effluent stream, treated to the Drinking Water Standards, of the Texas Department of Health. (Reference: Texas Department of Health, Division of Water Hygiene, Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems. (November 30, 1977)). 4

The estimated cost of the said multi-purpose project is $28,165,000 and it is anticipated that the project will be found eligible to receive 85 percent funding under the construction grant programs of the federal Clean Water Act of 1977. Subject to a favorable ruling by the Environmental Protection Agency (EPA) with regard to federal funding assistance, the City of El Paso plans to start design in October 1979, start construction in 1981, and complete the project in 1983.

If extensive artificial recharge of the Hueco Bolson Aquifer proves to be technologically and economically feasible for the El Paso area, it is anticipated that as much as 60 percent of the City of El Paso's total return flow from the municipal sewage treatment plants might be returned to the aquifer. This quantity of injected treated effluent would approximate 25 percent of El Paso's water needs over the next 60 to 70 years. Such extensive recharging of the aquifer would serve to decrease the ground water mining impacts (i.e., pumpage exceeding recharge); approach a stabilization of ground water levels in the aquifer; and, delay serious saline-water encroachment into the aquifer.

b. Availability of Rio Grande Waters: TDWR records show that the City of El Paso was granted amended Permit No. 1535B, dated August 25, 1969, authorizing the City to receive Rio Grande water of a quantity not to exceed 11,000 acre-feet per year (afy). This permit must be construed and implemented in light of the U.S. Supreme Court ruling made in October 1956, holding that the Irrigation District owned all the Rio Grande water allocated to Texas, including the sewage effluent of the City of El Paso after it is discharged into the Rio Grande. Therefore, the City of El Paso has purchased, and continues to

U.S. DEPARTMENT OF LABOR
EMPLOYMENT AND TRAINING ADMINISTRATION
WASHINGTON, D.C. 20213

13 AUG 1979

Commander
U.S. Army Defense Center and
Fort Bliss
Fort Bliss, Texas 79916

Dear Sir:

The Employment and Training Administration of the Department of Labor has reviewed the Draft Environmental Impact Statement on Fort Bliss, Texas, as requested by Mr. Bruce A. Hildebrand. We have only one comment.

On page IV-2, it is noted that should the base be closed, the local economies would lose the effects of a military payroll of $400 million and that 7,000 on-base civilian jobs would also be lost. While true as it stands, the statement is flawed by two omissions. First, the loss of the direct jobs and payroll ignores the indirect or "multiplier" jobs in the local communities. These are largely in such support industries as retailing, services, and the like. Hence, the total effect would initially be larger than those jobs at the installation. Secondly, however, a complete analysis would consider the alternative uses, both public and private, of the abandoned facilities and land now used for military purposes. Some of these alternative uses may allow the local communities ultimately to attain a level of economic activity greater than the military use now permits. 7

Sincerely,

William B. Hewitt

WILLIAM B. HEWITT
Administrator
Policy, Evaluation and Research

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

September 13, 1979

Commander
U.S. Army Air Defense Center
and Fort Bliss
ATTN: Environmental Officer
Fort Bliss, Texas 79916

Dear Sir:

We have reviewed the Draft Environmental Impact Statement (EIS) of Ongoing Mission, Fort Bliss, Texas. We are responding on behalf of the Public Health Service.

In addition to discussing the sources and quality of raw water for the Fort Bliss Reservation, the final EIS should describe the method of water treatment used, the quality of the treated water, and the water quality monitoring efforts for the treated water. 8

The method of waste water disposal and the degree of treatment provided should be discussed. A statement as to quality of final effluent and the monitoring program should be provided. The final EIS should also state whether a discharge permit is required or has been obtained, and whether or not Fort Bliss is meeting the discharge requirements. 9

What monitoring efforts are taken to ensure that no contamination of ground water occurs from the disposal of storage tank sludge and other hazardous wastes? 10

Thank you for the opportunity of reviewing this draft statement. We would appreciate receiving a copy of the final EIS when it becomes available.

Sincerely yours,

Frank S. Lisella

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Bureau of State Services

purchase water, under contract, with the said Irrigation District. The quantity of available water purchased by the City has averaged approximately 9,800 afy, over the past five years, and this quantity is expected to increase to the permitted quantity of 11,000 afy in future years. However, negotiations to date between the City and the District to obtain increased allotments of Rio Grande water have been unsuccessful.

Because the City of El Paso entered into a contract with the District in 1941, agreeing to own not more than 2,000 acres of water-rights lands in the District area (the Supreme Court held this contract to be valid) it is doubtful that the City of El Paso has authority to condemn and require additional farm lands with appurtenant rights to water from the Rio Grande. The City of El Paso discharges approximately 40,000 afy of treated wastewater effluent into the Rio Grande and the Irrigation District's drainage system, without either monetary or exchange water reimbursements.

4

2. Pages III-3 (section 3) and III-15 (section 6).

Attention is invited to the following statements on pages III-3, and -15, relative to water supply, quality, and conservation:

> "It is evident that the Bolson supply is the dominant source for the City at present. This is due to the low cost, good quality and ease with which it can be obtained and distributed even during the peak summer season." (p. III-3)
>
> ....
>
> "Fort Bliss has placed into effect a water conservation program to reduce the consumption of water." (Underlining added; page III-15.)

In extension of the foregoing discussion, it should be noted that several years ago, the City of El Paso adopted a conservation program by constructing some of their new water wells in the Hueco Bolson Aquifer in a manner to blend fresh ground water with slightly saline ground water produced from sands underlying the fresh water sands. This blending was intended to help reduce the depleting effects of ground water mining and to effectively use the lightly saline ground water reserves in the Hueco Bolson Aquifer.

5

While the composite water quality from El Paso Hueco Bolson production wells is somewhat variable, depending upon which wells are producing, and the variability of waters from the Rio Grande and the Canutillo Area, following is a Texas Department of Health August 1978 chemical analysis of treated water from the City of El Paso's water distribution system:

Constituent or Property	Concentration, (milligrams per liter)
Calcium	12
Magnesium	1
Sodium	96
Manganese	Less than 0.02
Iron	0.05
Sulfates	100
Chlorides	60
Fluorides	0.80
Nitrates (Nitrogen)	Less than 0.02
Total Dissolved Solids	307
Total Hardness (Calcium Carbonate)	36
pH	8.3

5

3. Page I-3 (section IC(1)), page I-17 (section IC1(k)), page I-18, -19, (section IC1(1)).

6

The descriptions of water and related land resources in above-captioned sections should indicate that the Department of the Army owns and controls approximately 44 percent of 150-square mile Hueco Bolson Aquifer area, from which an estimated 15 wells produce approximately 6,000 afy.

TDWR appreciated the opportunity to review the referenced DEIS, which appears to fulfill the basic analytical, coordinative, and administrative requirements of Section 102(2)(C) of NEPA of 1969. TDWR will continue to work closely with all agencies concerned in helping find solutions to water problems in the El Paso area, which we recognize is essential for the proper economic growth and viability of the area. Therefore, please advise if we can be of further assistance.

Sincerely,

Harvey Davis
Executive Director

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

September 7, 1979

Major General John J. Koehler, Jr.
Commander
U.S. Army Air Defense Center
and Fort Bliss
Fort Bliss, Texas 79916

ATTN: Environmental Office

Dear General Koehler:

We have reviewed the Draft Environmental Impact Statement (EIS) for the Ongoing Mission, United States Army Defense Center and Fort Bliss which is located near El Paso, Texas. While the Draft Statement assesses the environmental impact of the total mission, it focuses on base-support and training activities since these activities have the greatest potential to impact the natural environment. The ongoing mission consists of conducting field training exercises employing troops and equipment in tactical situations, missile and artillery firings, aerial gunnery training, air support operations and other related activities on the Fort Bliss Military Reservation. The Reservation covers approximately 1.12 million acres and is the largest air defense artillery center in the free world.

We classify your Draft Environmental Impact Statement as LO-1. Specifically, we have no objections to the project as it relates to Environmental Protection Agency's (EPA) legislative mandates. The statement contained sufficient information to evaluate adequately the possible environmental impacts which could result from project implementation. Our classification will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the Impact Statement at the draft stage, whenever possible.

We appreciated the opportunity to review the Draft Environmental Impact Statement. Please send our office two copies of the Final Environmental Impact Statement at the same time it is sent to the Office of Environmental Review, U.S. Environmental Protection Agency, Washington, D.C.

Sincerely,

Francis E. Phillips Jr.

Adlene Harrison
Regional Administrator (6A)

Enclosure

United States Department of the Interior
OFFICE OF THE SECRETARY
SOUTHWEST REGION
POST OFFICE BOX 2088
ALBUQUERQUE, NEW MEXICO 87103

ER 79/659

SEP 04 1979

Commander
Attention: Environmental Office
U.S. Army Air Defense Center
and Fort Bliss
Fort Bliss, Texas 79916

Dear Sir:

This is in response to a request for the Department of the Interior's review and comment on the Draft Environmental Impact Statement for the Ongoing Mission at Fort Bliss, Otero County, New Mexico and El Paso County, Texas. We have reviewed the draft statement and offer the following comments.

Considering the number and potential significance of archeological sites in the area, the identification and evaluation of historic and archeological resources appears to be adequate. We recommend, however, that the following additional actions be undertaken as soon as possible:

(1) Determination of eligibility for inclusion in the National Register of Historic Places should be requested from the Keeper of the National Register for any potentially eligible properties identified so far (see 36 CFR, Part 63 for appropriate procedures);

(2) The Department of the Army should consult with the Texas and New Mexico State Historic Preservation Officers and the Advisory Council on Historic Preservation to develop a Memorandum of Agreement covering further identification, evaluation, and treatment of significant archeological resources which may be adversely affected by activities on the reservation. 12

The Heritage Conservation and Recreation Service is available to provide advice concerning development of the proposed Cultural Resource Management Program. Please contact Dr. Jerry Rogers, Chief, Office of Archeology and Historic Preservation, Heritage Conservation and Recreation Service, Department of the Interior, Washington, D.C. 20243, for assistance.

The location of aquifer recharge areas on or adjacent to the military reservation and the impact of the ongoing mission (i.e., ordinance discharge and impact, vehicle movements, and accidental spillage or waste and hazardous substances) on the recharge sites should be addressed in the final statement. 13

The impact of biochemical agents, such as CS gas, that are employed in training on vegetation located within and adjacent to the boundaries of the 14

military reservation should also be discussed.

The section on "McGregor Range--Conflicts and (or) Inconsistent Land Use Plans" page II-3, has a number of inaccurate statements which should be corrected. PLO 1470, dated August 21, 1957, provided for a withdrawal of McGregor Range lands for ten years with an additional ten year extension of the withdrawal, upon timely application to the Department of the Interior. The second sentence of this paragraph refers to an "initial 20 year withdrawal." It would be technically correct to describe PLO 1470 as an initial 10 year withdrawal, with provisions for a 10 year extension.

The second sentence of this paragraph also refers to a 2 year administrative extension. This statement is also inaccurate. The 2 year segregation was the result of the Army's withdrawal application, Public Land Order 017802. The Las Cruces District Office of the Bureau of Land Management (BLM) processed this application, dated August 16, 1978, and forwarded it for further action with the recommendation that the withdrawal be granted. It was recognized that military use would be paramount, but the withdrawal would also provide for multiple-use management to the maximum extent possible.

Sentence 5 of this paragraph further states that: "However, the two year administrative extension has now expired due to the failure on the part of BLM, Department of the Interior, to consummate a new withdrawal." The Department of the Army applied for a new withdrawal for McGregor Range in 1977, which segregated the land for two years. The Department of the Army (DOA) filed a second application, prior to the expiration of the first two year segregated period, deleting 18,000 acres of Forest Service lands from the withdrawal. The modification of the second application to exclude Forest Service land, resulted in a new federal action requiring reprocessing of the new application. McGregor Range lands are now segregated for two years under the second application. The Bureau of Land Management is waiting for information from DOA, as is required under the Federal Land Policy and Management Act of 1976 (FLPMA) and the Engle Act, in order to prepare the case file for transmittal to Washington. As soon as this information is received from DOA the application will be processed.

Sentences 7 and 8 of the McGregor Range section and sentence 1 on page II-4 state: "... The Bureau of Land Management's cattle grazing operations, if carried out in accordance with their expressed plans, conflicts with execution of Fort Bliss missions. That is to say, because of the danger associated with missile and artillery firings, non-military activities must be excluded from the range while firings are being conducted. Accordingly, BLM's cattle grazing operations must be worked around military weapons firings and cannot be conducted on the scale desired by BLM." The BLM is in the process of preparing an Environmental Impact Statement (EIS) on livestock grazing on McGregor Range. The proposed action, similar to present grazing practices, and several alternatives including no grazing and the addition of three new units will be addressed. Until this EIS has been

completed, and a decision made on livestock grazing on McGregor Range, BLM will not know what the scale of grazing practices will be. This should be recognized in the statement.

Page II - 4, #4, Sentence 1 - "Post-military use will be affected by impact areas where unexploded ordinance exists, . . ." This section should be expanded to clearly delineate the BLM policy, as required under section V of FLPMA for cessation of withdrawn land. In keeping with the provisions of section V DOA would not be discharged of its accountability and responsibility of these lands until: 16

1. The lands have been decontaminated of all dangerous materials and have been restored to suitable condition, or, if it is uneconomical to decontaminate or restore them, DOA posts them and installs protective devices and agrees to maintain the notices or devices;
2. To the extent deemed necessary by BLM, DOA had undertaken appropriate land treatment measures correcting, arresting, or preventing deterioration of the land and resources which resulted from DOA's use or possession;
3. DOA in respect to improvements which are of no value, has exhausted GSA's procedures for their disposal and certifies that they are of no value;
4. DOA has resolved through a final grant or denial, all commitments to third parties relative to the right and privileges in and to the lands and interest; and,
5. DOA has submitted to the BLM a copy of, or the case file on, easements, leases, or other encumberances with which it has burdened the lands or interests therein.

Page III-II, Endangered Species: Our review indicates the ongoing mission may have an effect upon the endangered peregrine falcon, gray wolf, and black-footed ferret. Therefore, we request you enter into formal Section 7 consultation with the Regional Director, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, as provided by the Endangered Species Act of 1973 and January 4, 1978, regulations governing Section 7 consultation. This consultation will address the impacts of your action on the above-mentioned endangered species. If you need further assistance in the consultation process, we suggest you contact the Service's Endangered Species Specialist at either the Phoenix Area Office (FTS 261-6833) or the Regional Office (FTS 474-3972). It should be noted that plant species listed as Federally endangered on page III-11 and Appendix A are, at this time, proposed for Federal listing. We recommend that informal consultation be undertaken with the U.S. Fish and Wildlife Service in regard to these proposed plants to allow flexibility in the future if these species are listed. 17

Page III-12, Ecological Management Program: We wish to commend the Department of the Army on the foresight shown in development of the Ecological Management Program as mentioned in the draft environmental statement. We encourage implementation of the plan. 18

It should be recognized in the statement that in arid climates surface water resources are extremely important and regulate wildlife abundance and distribution. Existing watering systems on Fort Bliss Reservation lands should be maintained and augmented by additional watering systems where the lack of surface water is limiting habitat utilization by wildlife, such as mule deer, pronghorn antelope, and scaled quail. Water catchments, dugouts, small ponds, and other low cost watering systems, that are self sufficient, have been developed and implemented on many arid western areas. The construction of these watering systems requires a small surface area to retard evaporative losses, high holding capacity, and a shallow area to reduce drowning losses. Whenever surface water sites are destroyed, additional watering systems will need to be constructed. Furthermore, new watering systems constructed on the Fort Bliss Reservation to improve distribution should mitigate some of the detrimental impacts to wildlife resources. These components supplement mitigation measures in C.2. Biotic Resources (b) (page III-12). These additional measures combined with mitigative measures presently in Section C.1. and 2. (page III-12) if implemented should satisfy mitigatory responsibilities. 19

We appreciate the opportunity to comment on this draft statement.

Sincerely,

Raymond P. Churan

Raymond P. Churan
Regional Environmental Officer

Advisory Council On Historic Preservation

1522 K Street NW.
Washington D.C.
20005

Reply to: P. O. Box 25085
Denver, Colorado 80225

July 26, 1979

US Army Air Defense Center
and Fort Bliss
ATTN: Environmental Office
Fort Bliss, Texas 79916

Dear Sir:

This is in response to your request of July 10, 1979, for comments on the draft environmental statement (DES) for the Ongoing Mission at Fort Bliss, Texas.

The Council has reviewed the DES and notes the rich concentration of archaeological and historical resources, some of which are included in the National Register of Historic Places and others which may be eligible, many of which will be affected by activities of the Command. Such activities will require compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) in accordance with the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800), copy enclosed.

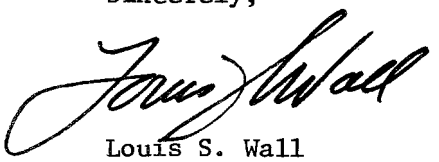
20

Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Council has determined that the DES does not demonstrate compliance with Section 106. However, it appears that the Army understands its responsibilities and will carry them out in the future.

To avoid unnecessary delay of actions implementing the Army's mission at Fort Bliss that will or could result in adverse effects on the cultural properties, we suggest a meeting with the Texas and New Mexico State Historic Preservation Officers and representatives from the Council and the Army to negotiate a Memorandum of Agreement in accordance with Section 800.6 of the regulations which will apply to future projects. Such an Agreement was concluded with Fort Polk, Louisiana, earlier this year; we are enclosing a copy of it for your consideration.

Please contact Mrs. Jane King, Staff Archaeologist, of the Council's Western office in Denver, (303) 234-4946, to make arrangements for the meeting. We look forward to working with you in the future in the completion of Fort Bliss' Management Plan and in concluding a Memorandum of Agreement.

Sincerely,



Louis S. Wall
Chief, Western Division
of Project Review

Enclosures

United States Department of Agriculture
Soil Conservation Service
P. O. Box 648
Temple, TX
76501

August 16, 1979

Commander
U.S. Army Air Defense Center
and Fort Bliss
ATTENTION: Environmental Office
Fort Bliss, TX 79916

Gentlemen:

We have reviewed the Draft Environmental Impact Statement of Ongoing Mission, Fort Bliss, Texas, and feel that the statement adequately reflects the impacts this mission will have on the soil, water, and plant resources.

21

We appreciate the opportunity of reviewing this draft statement.

Sincerely,

George C. Marks
State Conservationist

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FT. WORTH REGIONAL OFFICE
1100 COMMERCE STREET
DALLAS, TEXAS ~~75202~~ NEW ZIP CODE 75242

REGION VI

October 1, 1979

IN REPLY REFER TO:

Commander
U. S. Army Air Defense Center
Fort Bliss, Texas 79916

Attention: Environmental Office

Dear Sir:

The Draft Environmental Impact Statement for the Ongoing Mission, Fort Bliss, Texas, submitted with your letter of July 10, 1979, has been reviewed in the Department of Housing and Urban Development's Dallas Area Office and Dallas Regional Office and it has been determined that the Department will not have comments on this statement.

22

Sincerely,

Victor J. Hancock
Environmental Clearance Officer

cc:
Office of Environmental Review
Environmental Protection Agency (A-104)
Washington, D. C. 20460